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- Voice over IP explained
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- High-speed ADSL2 arrives

OVER 65 REVIEWS

- Sub-\$1,500 PCs, the latest games and much more!

MORE TIPS
THAN EVER!

- Share files with eMule
- MP3 alternatives explained
- Make a bootable photo CD
- Add a second hard drive
- Understand BIOS settings
- Manage projects with Excel
- Use Windows Movie Maker
- Paint with Photoshop
- Disk Management tips
- Colour selection guide
- Chronicles of Riddick: your exclusive game guide
- The best Half-Life 2 mods and much more

APRIL 2005

\$8.50 inc. GST NZ \$8.95 inc. GST



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net communications resource kit

3 months free access
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engin Xpro

Make cheap calls to any phone
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trial of this software service.

CallerID
Monitor 1.5

Full version as sold for \$10

Free softphones!

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with engin Xpro.
Firefly, Skype
and more.

PLUS: the latest
free messaging
and email clients.

EXCLUSIVE
VIDEO GUIDES



How to use Skype, Spyware Doctor and
Chameleon from PC & Mac! Plus, the latest
installments of VICE Videogames to Linux.

Spyware Doctor 3.0

FULL VERSION: As sold for \$38!



Detect and
remove spyware,
adware, Trojans
and other
tracking
threats.

Net Nanny 4

FULL VERSION:
As sold for \$89.95!



Protect your
children and
privacy
online by
filtering and
monitoring
Web content.

Ashampoo Audio
Rip & Burn 1.60

FULL VERSION: As sold for \$25!
Extract, burn and convert audio
CDs in a few easy steps.

HomeScreen:
Free DVD rentals for a month!

Valued at \$36.95! Try this online DVD rental service for
free, and get a free Hoyts movie pass when you subscribe.

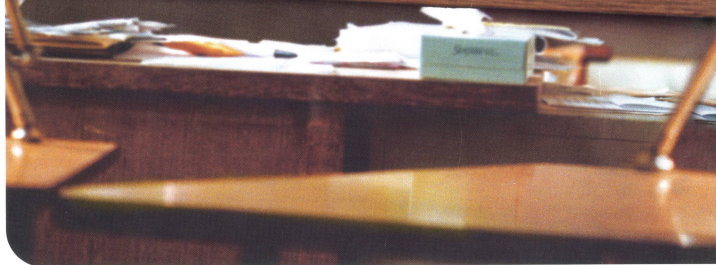


HALF-LIFE 2 MODS Freshened Half-Life 2 and
next issue! Try these free
mods. Plus the new classic games, playable versions of Battlefield,
Halo 2, Star Wars: The Force Unleashed, and more! See page 8 for full CD listing.

2 CD's

TUTORIALS • SOFTWARE • ENTERTAINMENT

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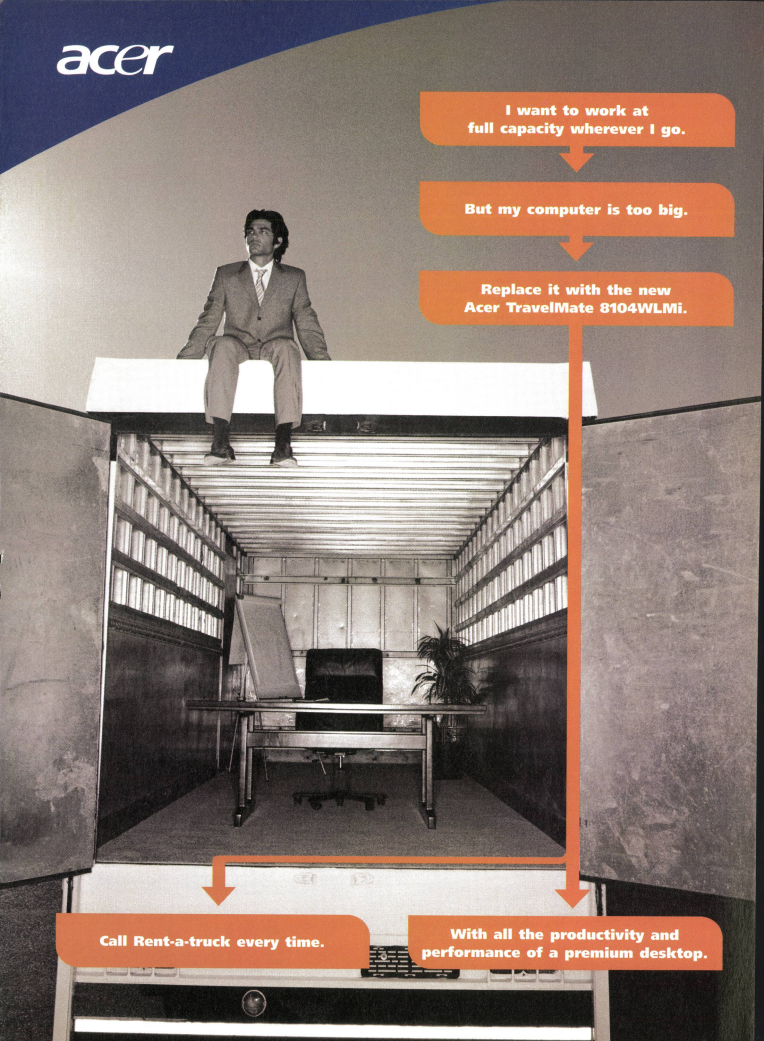
I want to work at
full capacity wherever I go.

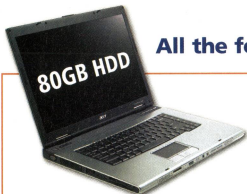
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Darren Yates,
Australian PC User Magazine
March 2005

The amazing new Acer TravelMate 8104WLMi notebook gives you the capabilities of a premium desktop with the mobility of a cutting-edge notebook. So why compromise, when you can get Intel® Centrino™ Mobile Technology, Microsoft® Windows® XP Professional, superior graphics on a 15.4" widescreen with a 30% greater viewing area, SmartCard security for investment protection, and SignalUp wireless technology that delivers 25% greater signal strength for the ultimate in mobile computing? It's everything you need to deliver, job after job. Call or visit your Acer dealer now.

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- Intel® 855GME Chipset
- Microsoft® Windows® XP Home
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*Source: RMIT Test Labs, August 2004.



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Processing Platform

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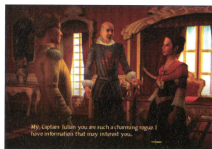


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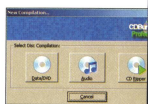
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**FOR YOUR CHANCE TO WIN AN
EPSON EMP-745 PROJECTOR
VALUED AT \$4,799**
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APRIL 2005



Cover Design & Digital Modification:
David Collins

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Hold the phone!

Save hundreds from your phone and broadband bills. We look at over 700 plans in our special broadband and VoIP superguide.

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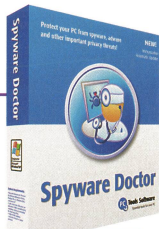


CIRCULATION: 64,332 copies sold per issue (ABC Circulation Audit, December 2004). **READERSHIP:** 423,000 readers per issue (Roy Morgan Readership Survey, September 2004). **WINNER** of the 2003 Sun Microsystems ITJourné Award for 'Best Technology Title for Consumers'.

CD contents

Spyware Doctor 3.0

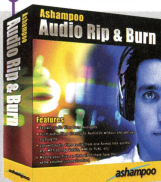
Detect and remove spyware, adware, Trojans and other tracking threats with this program. For more information, check out our tutorial on page 122.



REQUIRES ONLINE REGISTRATION

Ashampoo Audio Rip & Burn 1.60

Extract, burn and convert audio CDs in a few easy steps. Our tutorial on page 120 will show you how to get started.



REQUIRES ONLINE REGISTRATION

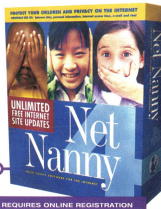


NOTE: Unless indicated otherwise, the listed programs may be shareware or trial versions.

PC USER

Net Nanny 4

Protect your children and privacy online by filtering and monitoring Web content.



REQUIRES ONLINE REGISTRATION

CallerID Monitor 1.5

Identify phone callers with your PC, a modem and this handy tool. Follow our tutorial on page 119 for more information.



REQUIRES ONLINE REGISTRATION

engin Xpro

Make cheap calls to any phone with your PC and an exclusive three-month trial of this softphone service. Our tutorial on page 118 shows you how.

DISC 1 NET COMMUNICATIONS RESOURCE KIT

- Active WebCam 5.3
- AOL Instant Messenger (AIM) 5.9.369
- BuddyTalk 1.0
- Camfrog Video Chat Pro 2.5
- DingTel PC 1.0.2.9
- engin Xlite
- Eudora 6.2
- EyeBall Chat 2.2
- Firefly VoIP Softphone 1.9.1
- FlashTalk 1.3
- ICConnectHere PC Phone 5.2.3.4
- ICQ Pro 2003b build 3916
- MeaPhone WorldCall 3.0
- mIRC 6.16
- Mozilla Thunderbird 1.0
- MSN Messenger 6.2
- PalTalk 7.0
- Pegasus Mail 4.12a
- Skype for Windows 1.1
- SMS Sender 1.11
- The Bat (Professional Edition) 3.0
- Trillian 3.0
- Yahoo Messenger 6.0
- Free full versions**
- CallerID Monitor 1.5

- CallerID Monitor 2.0 – trial
- GMS Control 1.0.1.0 – trial
- engin Xlite
- engin Xpro – trial
- engin Voice Box – trial

SOFTWARE

- Free full versions**
- Net Nanny 4
- Net Nanny 5.1 – trial
- Ashampoo Audio Rip & Burn 1.60
- Ashampoo MP3 AudioCenter 1.50 – trial
- CallerID Monitor 1.5
- CallerID Monitor 2.0 – trial
- GMS Control 1.0.1.0 – trial
- Applications**
- Adobe Acrobat Reader 7.0
- Axialis Professional Screen Saver Producer 3.62
- CD Bank catalogue 2.6.3
- Crystal Player Professional 1.85
- Cute CD DVD Burner 1.9.5
- Minos Album 2.2.0
- Musmatch Jukebox 10.0
- Paint.NET 2.0
- Stardock CursorXP 1.31
- TypingMaster Typing Test 6.3
- Browsers**
- Avant Browser 10.0 build 121
- Maxthon (formerly MyIE2) 1.1.115

- Microsoft Internet Explorer 6.0 with Service Pack 1
- Mozilla 1.7.3
- Mozilla Firefox 1.0
- Netscape Communicator (32-bit Complete Install) 4.79
- Slim Browser 4.03 build 007

Online tools

- AbsoluteShield Internet Eraser Lite 2.56
- Dan Elwell's Broadband Speed Test 3.0
- Download Accelerator Plus 7.4
- ENewsBar 3.05
- iNet Protector 1.12X
- IP Monitor 4.8
- Pluck 0.9.5 build 106
- Spam Blocking Agent 1.0
- WebFerret Free 5
- Web Translator 4.0

PC User's Essentials Pack:

- security & privacy tools**
- 12 Ghosts Wash LE 7.10
- Cryptainer LE 5.0.1.0
- FileMap by BB 3.0.2
- Grisoft AVG 7.0
- SpooStick for Firefox
- Spybot – Search & Destroy 1.3
- SynBack 3.2.5
- ZoneLabs ZoneAlarm 5.5.062

net communications resource kit

PC USER APRIL 2005 CD FEATURE

This month, we've included free softphones to allow you to make voice calls to other PCs, as well as the latest instant messaging and email clients.



HomeScreen

Valued at \$36.95, PC User readers can trial this online DVD rental service for free for a month, as well as receive a free Hoyts movie pass when they subscribe.



■ PC User's Essentials Pack: tools for magazine guides

Audacity 1.2.3
Azoreus 2.2.0.0
IE View 0.84
Mozilla Firefox 1.0
Mozilla Thunderbird 0.9
Nvu 0.5
OpenDownload 0.2.1
OpenOffice.org 1.1.3
The GIMP 2.0.5
Zwei-Stein 3.01

■ PC User's Essentials Pack: ripping & burning tools

CDBurnerXP Pro 3.0.116
CDex 1.51
LAME ACM Codec 0.9
TMPGEnc 2.521
VCD Easy 1.1.5.2
VirtualDubMod 1.5.10.1
XviD 1.0.2

■ System utilities

Ad-Aware SE Personal Edition 1.05
DirectX 9.0c
FileSplit 2.32 build 414
FileZilla 2.2.1
FolderSizes 3.1.0.2
Fresh UI 7.27
ProcessGuard 3.150
SpeedFan 4.20
WinRAR 3.40

WinZip 9.0

■ Mobile computing

Adarian Money 2.5
Arvale: Journey of Illusion 1.3
NewsBreak 1.0.1
Pocket Dictate 1.01
Resco Photo Viewer (Pocket PC) 5.2
Wi-Fi Hotspots Search Tool 1.0

MAG STUFF

■ Tips & tweaks:

Ripping & burning

Audiograbber 1.83
CDBurnerXP Pro 3.0.116
CDex 1.51
PC User JPEG View ISO Image

■ Tips & tweaks: Design

Color Wheel Pro 2.0

■ Tips & tweaks: Macros

datecheck.doc
listbox.xls

■ Tips & tweaks: Office

project.xls

■ Tips & tweaks: Windows 98/Me

Maxtor MaxBlast3
Seagate DiscWizard
TweakUI 1.33
Western Digital Data
Lifeguard Tools 11

USING THE CDs

Startup

The CDs use a Web-style interface. You only need to install a Web browser to be able to view the contents. If you already have a browser installed, then the CD will autorun (for Windows 95/98/Me/2000/XP) and load your default browser at the home page of the CD. If the CDs do not autorun, simply launch your favourite browser and open the page DEFAULT.HTM from the root of the CD. If you don't have a Web browser installed, you can install one from the CD. See the CD case for details.

System requirements

The PC User discs can be used with any PC that reads DOS-based CD-ROMs. However, we recommend use with Microsoft Internet Explorer 4 or later for Windows, which requires at least a 486 with 8MB of RAM. The third-party software on the CDs will often have higher system requirements.

Before using the CDs

We've provided installation instructions on the CD back cover, including what to do if you have problems. Please read these carefully before using our cover discs. Also, click on 'Terms of use' on the default page of either disc and read the terms and conditions of use before use. If you agree with the terms, you may continue to use the CD, and this use will constitute your acceptance of the conditions stated. If you do not agree with all of the terms, you may not continue to use the CD and you should return the CD and magazine to us for a refund. We also recommend that you read our Help file, which is available from the default page.

■ Broadband plans

Broadband plans.xls

DISC 2 RESOURCE KIT

■ Video tutorial

Skype for Windows 1.1
video tutorial

ENTERTAINMENT

■ Game demos

Darwinia
Nascar Simracing
UEFA Champions League
2004-2005

■ Game mods

Half-Life 2 Garry's mod v6
Half-Life 2 Pilotable Strider v0.2.5
alpha mod: Ride the
Helicopter v0.1
UEFA Champions League
2004-2005

■ Free games

Area 2048
David vs. Goliath
FlobPuyo 0.20
Secret Chamber
YS Flight Simulation System
2000 20040914

■ Patches

Pacific Fighters 3.03 to 3.04

Vampire: The Masquerade -

Bloodlines 1.2
Warhammer 40,000:
Dawn of War 1.20

■ DVD trailers

Ocean's 12
Cellular
After the Sunset

■ Movie trailers

Bad Education
Miss Congeniality 2
Son of the Mask

TUTORIALS

■ Video tutorial

Spyware Doctor 3.0 video tutorial
Ashampoo Audio Rip & Burn
1.60 video tutorial
Skype for Windows 1.1
video tutorial
VTC's Introduction to Linux

MAG STUFF

■ Game mods

Half-Life 2 Garry's mod v6
Half-Life 2 Pilotable Strider v0.2.5
alpha mod: Ride
the Helicopter v0.1
UEFA Champions League
2004-2005

Talking of change

Glenn Rees explains why we've redesigned PC User and the potential importance of Voice over IP.

Perhaps it's just us. We at *PC User* needed a change, but we think you, the readers, did too. After all, we'd had the previous magazine design for around three years, which is a long time in magazine-land. It's equivalent to around 15 years of having the same décor in your home.

It's not that we didn't like the previous design, which certainly served *PC User* well. But sometimes we all just need a change and, structurally, a redesign is needed to cater for inevitable changes in our needs (or more particularly, the needs of readers).

These structural changes include expanding and splitting the tutorial section into two: adding Tips & Tweaks, whose aim is help you get even more from your PC and software, while keeping Help Station, which will now be dedicated to helping solve your technical problems. We've also expanded the games coverage and broken it out into its own section known as Games Guide.

I won't go into the new regular features because I mentioned them last month. And I'll leave the other changes coming soon as a pleasant surprise...

However, I will repeat this from last month: we're not

changing the key things that have made *PC User* Australia's top-selling technology magazine. We'll always have down-to-earth, practical tips for buying and using computer hardware and software, including old yet still popular products such as Windows 98. We'll always have Australia's most trusted reviews of computer gear. We'll continue to have Australia's best team of technical writers. And, as always, I welcome any feedback you may have regarding the changes.

What's the fuss about VoIP?

Seeing in this new era for *PC User* is our coverage of an exciting emerging technology, Voice over IP (VoIP) (as it's known) isn't exactly new, but it's only now emerging as a viable technology for homes. There are some caveats that you need to be aware of, and you do need a good broadband plan, but potentially, VoIP can wipe hundreds off your phone bills each year (see our Broadband and VoIP Guide on page 34).

One of the pleasant surprises

of this feature was the hot competition in the VoIP, traditional phone and broadband markets. In particular, we found over 700 residential broadband plans from over 100 providers. As well as that, some providers are installing their own high-speed ADSL infrastructure. Based on the new ADSL2 standard (see page 39), this infrastructure will allow providers to offer faster and more reliable service. But perhaps most importantly, these providers are no longer totally relying on Telstra infrastructure as the basis for their service. Telstra still has a stranglehold on ADSL infrastructure around Australia, and will do so for the foreseeable future, but anything that loosens that grip (even just a little) is good news for competition and, therefore, consumers.

The phone market (both fixed and mobile) is also more competitive than ever, but it's the emergence of VoIP that's the real wildcard. The adoption of VoIP is totally reliant on the broadband market, but if the latter continues its stellar growth then VoIP has the potential to give the traditional fixed phone market a big shakeup. That may not be good news for the big telcos, but it's good news for us.

On the other hand, with the full privatisation of Telstra now inevitable, let's just hope that the Australian Competition and Consumer Commission (ACCC) can continue its good job in ensuring Telstra shares its still-dominant telecommunications infrastructure equitably. ☺

PC USER

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CD Support: puserscd@aap.com.au
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EDITORIAL ENQUIRIES

Phone: (02) 9288 9111
Email: pusers@aap.com.au
Fax: (02) 9267 4909

ADVERTISING ENQUIRIES

NSW & VIC: Chris Greenwood
(02) 9288 9107
Email: cgreenwood@aap.com.au
Queensland: Noel Fitzpatrick
(07) 3000 8500 **South Australia/**
Western Australia: (08) 9379 2444 **Shop/Classifieds:**
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Jackie McCarthy (02) 9282 8688
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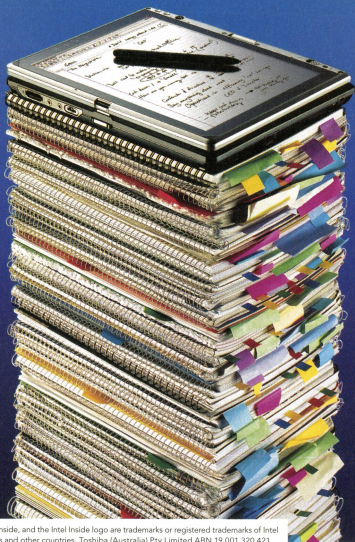
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COMING UP

Whether you want to burn DVDs with your home movies, back up your data, increase your hard disk capacity or add storage to a small business network, we've got the solution in the May 2005 edition of *PC User*. That's as well as all our new and regular tips and tutorials, the latest reviews of computer and home entertainment gear and much more.

Toshiba recommends
Microsoft® Windows®
XP Tablet PC Edition.



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What if every note
you ever took was
saveable, searchable
and sendable?

OBSERVATION: Many highly efficient people pour their daily output into two incompatible receptacles: all documents, spreadsheets and presos go into a computer, while handwritten notes disappear into pads, filing cabinets and mountainous piles. This, frankly, is highly inefficient.

SUGGESTION: Imagine a system that stored every scribble, note and doodle, and enabled you to find those ideas, insights and other handwritten gems days or months later, and do so in seconds. Sound more efficient? Then perhaps you should be working on Toshiba's latest Tablet PC.

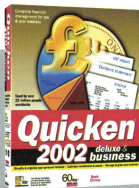
PAYOFF: The Portégé M200 is a convertible, so you still have a fully functional notebook computer powered by Intel® Centrino™ Mobile Technology. But where once you'd have picked up pad and pen to make notes, now you convert to tablet mode and pick up the stylus. You can then write directly into Microsoft® OneNote (a powerful note management program, bundled on the latest Toshiba mobile computers). OneNote auto-saves every stroke of the stylus and allows you to search by date, name, content, scribble and more. In the past, you might have wasted hours looking for notes, numbers or minutes. Now your daily intellectual output is stored in one place, and remains accessible anywhere, at any time.

ACTION: For more info or to organise a demo, see your nearest Toshiba Authorised Reseller, visit www.isd.toshiba.com.au/tabletpc or you can call 13 30 70.

TOSHIBA

Re-registration revisited

Dodgy deals or simple mix-ups? John Hilvert takes a closer look at reader complaints.



BEAT THE RE-REGISTRATION BLUES

1. Fees for re-registration have been a sore point with users because they may feel them as a fee imposed for re-registering after rebuilding a system, rather than as a fee for technical support. At the same time, Quicken is entitled to organise their terms of trade and support in ways that are lawful, which protect its interests against the prevalence of software piracy.

2. The issue remains one of managing expectations, especially to users about support fees. Ideally, Reckon should consider incorporating a version of its table of charges at www.quicken.com.au/services/servicecharges.aspx with its packaging, so there are less tears down the track.

Reader Peter Croft complains he has to pay to upgrade his versions of Quicken and QuickBooks.

"I've been an owner/user of Quicken products for nearly 10 years, but I've had to jump through these registration hoops many times. Because I built a new PC about six months ago, I've run into the 'pay to re-register' brick wall. Because I have a couple of upgrade versions, that means that, in theory, I have to go back to the earliest full-price version, install and try to register that. But they won't re-register it! They say it's too old and they are not budging.

"Their attitude is that because it is my 'fault' that I need to reinstall my legally bought and paid for software, I have to pay \$9 for phone support to try to get a new registration number, but they won't issue one for the earlier version that I need to install to get my two year old versions working again! They say these are 'sun-setted' versions that they don't support any more. And they say I agreed to this policy by accepting the legal fingerprint in the first installation.

"There's a more serious issue here. Potential Quicken and QuickBooks users should be aware that you are at the mercy of Reckon Australia to access your financial data. If you run a company using Quickbooks, you can quite easily be locked out of your business's bookkeeping system if you can't agree with or negotiate Reckon's registration policy.

A representative from Reckon responded to what Reckon sees as inaccuracies in the way our reader portrays Reckon:

Where a customer has been hard done by we will act to remedy that situation. But any situation always has two perspectives.

At the most general level it is totally inaccurate to state that a user can be locked out of his or her bookkeeping system. If Mr Croft wants to use his first version of QuickBooks we will gladly supply him with a registration key. All this requires is that he pay a nominal fee of \$9. This is a fee for technical support and is not some sort of ransom as his letter implies. We will never force a customer to buy an upgrade if they don't want one. They do of course remain at risk in respect of compliance and lose out on functionality and improvement, but that is their choice.

Quicken licenses software in two ways: a full version of the software or a subscription version of the software. In either case the customer acquires rights to use the software under permission from Quicken.

If you are licensed to use a full version of the software you pay slightly more than if you were to be licensed by subscription, but you do acquire a right to use that version of the software indefinitely. But that is where your rights end. There is nothing implicit in the purchase of software that support of that software (such as a call to a call centre for assistance) is for free. That expectation does not normally exist when consumers buy other products, why is the assumption that somehow software is to be treated differently?

Equally if you try to install the software on a new PC, when the box stated "To be installed on one PC only", why must Quicken Australia bear the cost of an event over which we have no control and which, but for requesting re-registration, might be a violation of the licence conditions?

If you are licensed to use the software on a subscription basis then the price is less than that charged for a full version, but you do get upgrades during the

period of your subscription. At the end of your subscription period your right to use the software terminates. It is like pay TV, you know this when you buy it and you are not held to ransom if you don't renew it — you just don't get it anymore.

From a rational business perspective it is not efficient for Quicken to provide technical support to several versions of the software.

Our sunset policy offers technical support to users of software that is no longer than two years old or no older than the second version of the release they were licensed to use.

Technical support is not available for sun-setted versions. Technical support for any version that is not sun-setted is not free. If you are a paid member of the Quicken advantage programme then you get technical support via a dedicated line. If you are not, you pay.

Going forward we have built even better antipiracy protection measures into our products, all of which are transparent to the user and which should not be a cause for concern. Consumers should also be expected to take responsibility for managing their affairs.

Cut through the hysteria, appreciate it from a business perspective and the benefits are ultimately passed on to the customer. ☺

CONTACT CONSUMER REPORT

Have you been a victim of poor customer service or support? We'd like to hear about your problems and try to resolve them. Send a letter of no more than 300 words to pcuserreport@acp.com.au or address your letter to Reader Report, GPO Box 4088, Sydney, NSW 2001. Please include a daytime contact phone number.

BUG & VIRUS REPORT

Big brother updates

Updates will check the authenticity of your software, says Rose Vines.

Is your copy of Windows legit? If not, you're going to find life a little more difficult from now on. Microsoft has decreed that only those who have a verified copy of Windows will be able to download add-ons and updates. To access any such downloads from Microsoft's site, you'll need to run a tool that checks the authenticity of your copy of Windows.

This new regime is known as Windows Genuine Advantage.

Its aim is to make it painful to own a pirated copy of Windows, while offering legal users incentives such as free downloads, discounts and special subscription services.

Of course, given the way viruses and other threats operate on the Internet, any insecure computer is a risk to other computers, so Microsoft is not completely blocking updates to unverified users. Instead, those users will be able to get operating system updates if they activate the Automatic Updates feature. If you do that, of course, you'll be relinquishing control over which updates are installed on your computer. That's not usually a concern, except that some Microsoft updates have been known to cause their very own

set of problems.

The other concern is about the verification tool itself. I've already seen this tool fail to recognise a legitimate copy of Windows installed by Dell. Let's hope Microsoft does some more debugging before it unleashes the program on all of us.

✪ Voyage of the Bagel

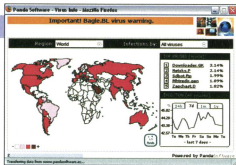
The Bagel worm, which first appeared in early 2004, continues to crop up in new forms. A widespread outbreak of a new variant, W32/Bagel.bj@mm, occurred in January this year.

You might think that existing antivirus defences would protect you against a modified worm such as this, but that's not the case. Bagel tries to disable

your antivirus software, so it's important you have an up-to-the-minute update of your antivirus signatures and software that is clued enough to recognise the threat. New versions of programs such as Trend Micro's PC-cillin include a component to watch for Net threats such as the Bagel worm. Make sure your antivirus software is smart enough to do so.

Bagel, by the way, is also known as Beagle, and the naming is slightly different depending on the antivirus software vendor. Symantec, for example, calls the worm W32.Beagle.AZ@mm; PC-cillin identifies it as Worm_Bagel.AZ.

Another similar worm, Netsky, has also made recent appearances in new guises.



Panda Software (www.pandasoftware.com) provides real-time visual updates of active virus threats.

HARDWARE REPORT

'Cell' chips to take over?

Computing of Godzillalike proportions could soon hit a phone line near you, writes Darren Yates.

It sounds like something out of a science fiction movie, but if IBM, Toshiba and Sony have their way, the world could end up becoming one giant computing organism based on Cells. Or Cell processors to be precise. The new processor, simply called Cell, is designed to work like cells in the human body — a basic building block that combines with other cells via

software to carry out computing tasks. But its ability to scale from handhelds to huge data storage centres is what could see the Cell chip become larger than life. In a press statement, IBM claimed Cell would result in "consumer devices that are more powerful than IBM's Deep Blue super-computer".

The intriguing possibilities being raised in online reports include the ultimate in 'distributed computing' or 'broadband computing', geek-speak for computer software able to find spare processing horsepower of Cell chips all over the world to speed up computations. For the more entrepreneurial, you could

possibly create 'Cell farms' and rent out your Cell processors via high-speed broadband at \$1 per CPU hour, like Sun Microsystems' new Sun N1 Grid Engine, which began operating in February.

So far, the Internet has really just been a tool for transferring fixed, pre-processed data such as emails, photos (and credit card numbers if you're a hacker) but with broadband computing, it could theoretically become a pipeline to vast computing power, all sitting at the end of your phone line.

Just as Australia continues its love affair with cheap electronics goods from China, we could end up importing our computer horsepower via the

telephone line.

PCs could simply become the dumb network terminal similar to the 'Network Computer' Oracle boss Larry Ellison tried to foist onto us 10 years ago, with a huge broadband Internet connection hanging off the end. Or we could see PCs sell like mobile phones — free on a 'Computer-10' plan for occasional users, or a wider-bandwidth power user's plan such as the 'Gamer-50'.

Of course, it may not happen, but we'll soon find out — the first Cell chips are expected to power the upcoming PlayStation 3, as well as new high-definition TVs from Sony and Hitachi next year. ☺

UP AND COMING

Your next TV

Plasma might still be all the rage, but don't discount other screen display options when you choose your next television set, says Anna Raciti.

Given the hype surrounding plasma displays, you could be forgiven for believing that plasma TVs are the way of the future. But this year, some dominant players are going to be steering the market towards other display technologies.

Sony, a leader in the production of plasma TVs, recently denied plans that it was abandoning the manufacture

of plasma screens, but the company admitted it would concentrate its efforts on other television technologies. Here at *PC User*, we're not surprised by Sony's less-than-enthusiastic backing of plasma technology. Sure, these sleek, super-thin displays look the business, but regular readers will know that *PC User*'s technical experts are no fans of plasma. Our lab tests have left us disappointed with the display quality you get for the price.

But if plasma is not the television technology of the future, what is? For Sony, it's LCD (liquid crystal display) — the other flat-panel screen technology. Last year, the company formed a partnership with Samsung Electronics, opening a huge LCD panel production plant in South Korea

in order to rapidly grow the LCD TV market. This will significantly boost the number of large LCD panels being produced, and of course, lower prices. So keep an eye out for a flood of new LCD TVs hitting retail stores mid to late this year.

Another option that's becoming more and more appealing is replacing your television set with a projector. In the past, the high price of projectors (and their replacement lamps) made them an expensive option for everyday television viewing. But as prices plummet, the

projector is starting to look really appealing. Last year, a few companies such as Epson and Sony released quality projectors priced at around \$2,000, aimed squarely at the home market. This year, they've come down in price again. BenQ and Acer sell models priced at \$1,500, and this month we've even reviewed a neat little NEC projector that sells for a tiny \$1,399 (see page 130).

At those prices, you can enjoy a huge display for a fraction of the price of plasma and LCD — and you'll feel like you're in a movie theatre every time you turn on the telly.

HELP STATION REPORT

How good is cheap ink?

Paul Zucker reports that Help Station readers have had a lot to say on the subject of non-original ink in printers.

Some questions on Help Station (www.pcuser.com.au) stay fresh for a long while, simply because they relate to things we all encounter. Others develop over time, so we reactivate them to get the latest feedback from readers. One of these is the old 'should I only buy the manufacturer's ink for my

printer, or is it okay to refill?' conundrum.

When the question was first raised on Help Station, it was straightforward. Most readers simply wanted to know if it would void their warranty, as the manufacturers warned. Once that was answered (no, it doesn't void the warranty in most cases), we started to discuss the difference between everyday printing and photo printing. Many readers were of the opinion that third-party ink is fine for the former, but useless for the latter, where colour accuracy is essential.

Some readers warned against any form of refilling, quoting horror stories ranging

from ink spills to clogged heads in Epson printers (where the head is part of the printer, not on the replaceable cartridge as with other brands).

Other readers sang the praises of ink-replacement services advertised in *PC User*, which are available from Internet-based stores. Others pointed out that pre-filled cartridges from well-known brands such as Pelikan and Calidad were not only safe (and backed by a guarantee), but around half the price of the originals.

Then came the complication of smart cartridges that use chips to make it difficult to use third-party or refilled cartridges.

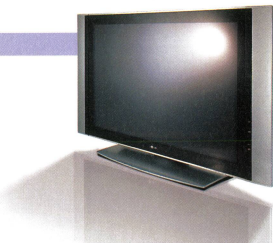
It didn't take long for readers to start sharing their experiences with chip-resetter gadgets that overcome the problem.

In the end, it is up to the user to decide what sort of ink to use, but thanks to reader feedback on Help Station, we can make a better informed decision.

To check the feedback on Help Station, search for these terms. Each gives an interesting range of hits:

ink AND "fill refill"
ink

(Note the use of the wildcard asterisk in the search terms. Try searching for **ink** and then for **ink*** and notice the difference.) ☺



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Prize for the Letter of the Month

This month's letter of the month prize winner will receive a 128MB USB 2.0 flash drive from Comsol. The drive is compatible with PCs and Mac computers, and features a protective cover for the USB plug.

Letter of the Month: Recover stolen computers

After recently having my laptop stolen, I came up with a concept for the recovery of stolen computers and of course it should lead to the recovery of other items stolen at the time.

I would like to see Microsoft initiate a global community project whereby the MAC addresses of stolen computers can be listed on an online database. When the operating system detects a connection to the Internet, it takes the MAC address (or addresses) of the computer it is installed on and checks for these addresses in the database. If a match is

found, the database centre can report to the local police where the computer is, by using the IP address it was working from and the ISP (this should work through NAT and other routing). This being a part of Windows, it should be able to go through firewalls unchallenged. With this information, the user of the computer can be tracked down by the authorities to recover the stolen computer and other items.

I'm sure Microsoft could add the functionality to all the operating systems with the online updates if they wished. It would only be the most

warped privacy issue advocate who could object to such a system.

**Brad Carruthers,
Runaway Bay, Qld**

The writer of the best letter to PC User each month wins a prize. Just send your letter of no more than 300 words to PC User (see 'How to contact us', page 10), and please include your postal address and daytime telephone number. Entry is open to all residents of Australia other than employees of ACP Publishing. Entries for May close on March 15th. The judges' decision is final. All entries become the property of ACP Publishing.

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Thanks from NZ

First of all, I would like to congratulate you on a great magazine. I am a student in Auckland currently pursuing a degree in computing, and I find the magazine very helpful at all times, keeping me up to date with technology. I have been buying it for a long time now, and each issue is better than the one before it every time. The CDs provided are always packed with the best programs.

Your software and hardware reviews are awesome, and they have helped me to make very good decisions on which products to buy and recommend to others with confidence. I found January's edition outstanding because of the '8th Annual PC Upgrade Guide'. I was thinking of upgrading my whole PC, but with the Upgrade Guide, I am now going to build a gaming PC

by myself. The guide has made it very easy for me to actually see which hardware would perform best. All I have to do is just go out and buy the components.

Until now, you have been covering a lot of ground from hardware to troubleshooting and I hope to see this continue in the future. Once again, thanks for a marvelous magazine. Keep up the excellent job.
**Sumeet Satishwar
Auckland, NZ**

Identify your discs

I am writing this in response to your 'Burner stops burning' tip in the February issue of PC User (see page 59). I just thought I'd share my two cents' worth of experiences when I started using DVD burners.

When I first got my burner, I did some research on which is

the best media available. Of course, good media doesn't come cheap. Then I came across some interesting software called DVD Identifier (<http://dvd.identifier.cdfreaks.com/>). Not only can this software trace the CD's origins, it also shows the model number of the CD. It's actually interesting when you find out some cheaper, more generic brands actually use the same dye as the top-tier DVD brands. For example, I found out that my cheap Arita DVD+RWs actually use the same dye technology as Ricoh, a rather distinguished company. Not only that, it even states the manufacturer as Ricoh.

I would just buy a few samples of rather generic DVDs from my regular store and using the software, I could identify them and compare them with reviews from another interesting site called VideoHelp.com (www.videohelp.com). If most of the reviews are positive, it's usually a safe bet that the



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CDs will burn fine. However, with generic brands, I would only go for those manufactured by the more branded companies. That way, I can save and at the same time avoid the heartache of having two-thirds of my spindle becoming coasters. I hope this helps.

Chong Fu Shun
Brunswick West, VIC

Bizarre memory

I write in response to Joseph Bajada's letter entitled 'Who is spying on me?' in the February issue (page 14). He complained that certain programs had scheduled his computer to start up, dial up, and then report printer and scanner usage statistics to the manufacturer. It occurred to me that for this to happen, a fundamental error in Internet security must first be made: saving the password!

Be warned, allowing any software to save (or autocomplete) passwords for

any purpose is inviting an online security breach. If you cannot remember passwords, then at least make sure the information is stored in hard copy, and not on the hard drive.

Better still, learn some memory training tricks. For example, make up a little story that describes your password — the more bizarre the merrier! It only takes a few minutes and a little effort.

David Hardwick
Runcorn, Qld

Bring on Linux

I am writing to say that you run a great magazine. I have been a subscriber for more than two years and will continue to subscribe. I especially like the addition of more and more Linux.

I have recently begun to play with Linux, recycling some of my older computers. I have found a distribution of Linux called ClarkConnect, which is a dedicated server distribution based on Red Hat Linux 9. I have it running on a Pentium

150MHz with 32MB of RAM. This system runs with no monitor and most of the setup of the system can be done via a Web browser and the rest via SSH.

I think ClarkConnect is great for beginners and there's tons of support in the forums on the Web site (www.clarkconnect.com). Even if you don't have an old PC to use, you can get a cheap one like mine for as little as \$80, or less at swap meets. Just thought I'd mention it and maybe you could write an article on it. Keep up the good work.

Paul
Melbourne, Vic

Media centre PCs

I've been following your magazine for about six months now and watching the rise of the media centre PC coverage. After our home VCR died, I decided to build my own media centre machine.

In your reviews you had noted that some brand-name offerings were asking \$2,500 or

\$3,000 for a machine (plus Windows XP Media Center Edition) and scorned the high prices. Reading the article, it seemed as though the absolute minimum that you need to pay is \$2,500 for a decent machine to record and play back TV and DVDs.

Fortunately, I only paid a total of \$800 for my machine. Since I was recording from a digital TV tuner card, and playing back through an Nvidia card with hardware MPEG-2 acceleration, I didn't need a high-speed, high-hat, high-noise, high-cost processor or buckets of memory. Since I already have a screen, I didn't see the need to pay huge amounts of money for a flashy-looking large LCD. I also didn't bother buying any software, since I used Fedora Core 3, MythTV and the excellent online installation guides at www.wilsonnet.com.

I'm putting the money I saved toward buying a full-power surround sound receiver and widescreen TV — a much better use of the money, in my opinion!

Paul
Internet ☺

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1 Information on how to enter and prize forms part of these conditions of entry.

2 Entry is open to all residents of Australia who subscribe or renew their subscription to PC User between 02/03/05 to 05/04/05. Entry is automatic upon and subject to the correct use of a valid credit card or, if payment is made by cheque, the cheque must be cleared for payment.

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their name will be published in the Public Notices section of *The Australian* on 12/04/05. Judges' decision is final and no correspondence will be entered into.

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Reinventing the micro PC

The PC User team tests the latest hardware and software, including three unique new micro PCs.

Trigem KLOSS KL-I915A

The Trigem KLOSS is a micro PC with a rather novel design: the case is split into top and bottom halves. The motherboard is installed on the dividing platform in the middle of the case, with the drives and power supply mounted below. This keeps the motherboard free of cables and much more open to help dissipate heat. The CPU heatsink incorporates heat pipes, and a small duct in the

top of the case helps keep temperatures down.

The front panel combines an informative display with play, skip, stop and mute buttons, along with a large volume knob that can also change your equaliser, effects and speaker levels. In addition, there is a CPU clock button, which can adjust the CPU speed on the fly according to your settings.

The included remote control is configured to be used with

CyberLink's PowerCinema media playback software, which is included with the system. You can also assign Windows commands to the remote's buttons through the i-Mon software, although how useful a remote can be in other applications is questionable.

The KLOSS was the best performing micro PC we tested this month, with a Business Winstone score of 36.6 and 56.8 in Multimedia Content Creation Winstone. It easily had the competition covered. The



Price: \$590 **Contact:** Altech Computers
Phone: (02) 9735 5655
Web: www.klosspc.com + Quiet
+ Good front-panel display
- Limited upgradeability

integrated 915G graphics did relatively well, producing an average of 62 frames per second (fps) in Unreal Tournament 2003. It scored only 6.1 fps in DOOM 3 with the onboard graphics, and 75.4 fps with a PCI Express (PCI-E) Radeon X800 XT installed.

The Trigem KLOSS is a fine micro PC from a somewhat new player in the scene. It's sure to develop their reputation as a serious competitor in the small form factor market.

— Nick Mailath

OUR PRICES

The prices provided in PC User's product reviews are generally recommended retail, but because actual pricing is often significantly less, we've tried to use online retail prices whenever possible. The prices were accurate, as supplied by vendors or as advertised on Australian retail Web sites, as of mid February. Note that prices change rapidly and can vary significantly between retailers, so we strongly recommend shopping around yourself. Start with Web sites such as www.ht.com.au, www.corpsoft.com.au, www.razorprices.com and even an Australian search of www.google.com.au. Remember to check out the delivery fees and other charges.


TEST RESULTS

VeriTest Business Winstone	36.2
VeriTest Multimedia Content Creation Winstone	56.8
Unreal Tournament 2003 average/low fps	61.9/24
DOOM 3 timedemo demo1 average fps	6.1

ASUS S-presso S1-P111

ASUS' entry into the micro PC market is the S-presso, a unit with a stylish case, bright LED display with touch sensors in the front panel, and it's equipped with InterVideo's InstantON operating system.

InstantON is a media centre front end that can be used without using an operating system. Through InstantON, the S-presso lets you watch analog

TV and DVD movies, listen to music or FM radio and even view pictures. A remote control is included, so you are free to navigate from the comfort of your lounge. The LED display can be customised using the Front Panel Display software utility: you can choose from a number of different outputs, such as fan speeds and temperatures. 

Price: \$599 **Contact:** Cassa
Phone: (02) 8748 6755 **Web:** www.asus.com.au + Stylish case + Incredibly quiet - Poor integrated graphics performance



ASUS DVD Burners enable 16X Burning with 8X Discs

Although DVD burning technology has progressed to 16X, the supply of disc media supporting this new high-speed standard remains low. Even if you are one of the lucky few that is in possession of these expensive discs, you still have to worry about burning reliability unless you want a stack of overpriced coasters.

Optical drive makers, of course, won't let their technological advancements go to waste. Take ASUS for example, the company introduced an innovative feature called "Over-Speed Burning". This feature enables users to enjoy fast 16X burning with 8X discs, which are more readily available and more affordable. It's a cost-effective way to shorten burning time.

Double burning speed on dual-layer discs

Over-Speed Burning also supports double-layer discs, which offer large data capacity up to 8.5GB, roughly 2,000 MP3 songs. Most double-layer discs at the moment support 2.4X speed, meaning to burn a full disc takes approximately 40 to 50 minutes. 4X discs are available as well, but higher speed also comes with higher price. With Over-Speed

Burning, you can burn an 8.5GB, 2.4X double-layer disc in only 26 minutes.

Disc quality detection for best burning speed

The advantages of Over-Speed Burning are pretty obvious. The one thing you need to pay special attention to is disc quality. Please make sure you purchase discs approved by the manufacturer of your drive. ASUS implement a mechanism for disc quality detection and intelligently adjust for the most suitable burning speeds to prevent poor quality and damaged discs.



In conclusion, if you know what to look for, enjoying the fastest burning speed doesn't necessarily have to mean emptying your wallet. DVD burners with Over Speed Burning are excellent solutions as the shortage of 16X and 4X dual-layer discs continue and these discs remain expensive.

Double layer burning comparison

Disc media	Burning speed	Burning time	Good	Bad
2.4X	2.4X	40-50 min	· Disc is easily attainable · Affordable	Long burning time
4X	4X	26 min	· Short burning time	Supply is low Very expensive
2.4X	Over Speed at 4X	26 min	· Disc is easily attainable · Affordable · Short burning time	High-quality discs needed

The Choice of Expert Gamers

ASUS Gamer Edition Cards Deliver Big Bang for the Buck

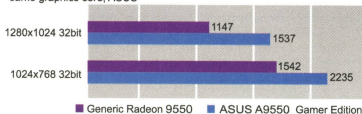
The launch of new titles such as Lineage II and Doom 3 should propel a wave of system upgrades among serious gamers, since more powerful video performance is needed to smoothly run the latest 3D games. Taking into account that many gamers probably don't have huge budgets to enhance their gaming systems, ASUS, a leading provider of graphics solutions, recently introduced special Gamer Edition video cards, which offer explosive graphics at affordable prices.

Improved circuitry and memory modules

Gamer Edition cards, as the name suggests, are specifically tailored towards keen gamers. Gamer Edition cards have redesigned circuit boards, upgraded memory specifications along with other extra features. Compared with solutions supporting the same graphics core, ASUS

Same performance using lower-end graphics core

It takes strong engineering to be able to redesign the reference card. The ASUS V9999 Gamer Edition runs on Nvidia's 6800 chipset, but the card's performance actually approaches those supporting the next-level chipset, the 6800GT.



3D Mark 2003

Gamer Edition cards deliver superior video performance.

For example, the ASUS A9550 Gamer Edition (supporting ATI's Radeon 9550 chipset) provides a 25% performance increase compared with typical Radeon 9550-based graphics cards. And the ASUS V9250 Gamer Edition (supporting Nvidia's FX5200 chipset) is 50% more powerful than other FX5200 solutions.

With higher-end memory, the prices of Gamer Edition cards are slightly higher than solutions using the same graphics core, but enable far better video capability. ASUS Gamer Edition is currently the choice of many gaming experts and users who demand top-of-the-line visual effects. Give a little more and you'll get back so much more.



⦿ The S-presso's noise levels were excellent in our tests; in fact, it was so quiet we had to double-check to make sure the CPU fan was actually plugged in (which it was). The loudest noise generated by this system was the CD-ROM drive spinning up.

With a 3.4GHz Pentium 4 and 1GB of RAM, performance was OK, but not overwhelming. It scored 43.3 in Multimedia

Content Creation Winstone, although the Business Winstone benchmark failed to complete. The onboard graphics left a little to be desired, only reaching an average of 18fps in Unreal Tournament 2003 at 1,024 by 768. After installing a Radeon X800 XT PE, DOOM 3 scored 94.5fps.

The S-presso has only one 3.5in and 5.25in drive bay, which limits the upgradeability

somewhat, but as long as you choose the right components, it still has the capability to be a powerful system.

ASUS has designed a well-

rounded micro PC and packaged it in a unique case. All up, the S-presso is a rather appealing system.

— Nick Mailath

TEST RESULTS

VeriTest Business Winstone	Did not finish
VeriTest Multimedia Content Creation Winstone	43.3
Unreal Tournament 2003 average/low fps	18/9
DOOM 3 timedemo demo1 average fps	Did not finish

Shuttle XPC SB86i

Shuttle's latest small form factor barebones system is a little larger than the models we've tested in the past; in fact, it's so big and heavy that it clocks in at 7.7kg. That's almost two-and-a-half times heavier than the last Shuttle we tested (see *PC User* March, page 19).

Thanks to its use of the new BTX standard, the SB86i's CPU socket is closer to the front of the case. This allows it to draw cool air directly through the front vents.

However, the CPU fan speed is controlled by the motherboard and, when under load, it becomes quite loud. While

watching XviD movies, the Shuttle remained quiet in our testing, but as soon as we did anything CPU intensive, the fan cranked up and along came the noise. While the box claims the SB86i features 'whisper quiet cooling', we found this to be the loudest Shuttle we've had in *PC User* Labs.

We tested this system with a Pentium 4 560 (3.6GHz), 1GB of RAM and both the onboard graphics and a PCI-E Radeon X800 XT. The SB86i utilises Intel's 915 chipset with integrated audio and video, so game performance isn't great. Unreal Tournament 2003 was playable with an average score

of 58fps. DOOM 3, on the other hand, crawled along at 6.3fps.

After installing the X800 XT the scores went up, but not to the levels we expected. DOOM 3 reached 56.7fps, although strangely, after lowering the CPU speed to 2.8GHz, it scored a much higher 66.5fps. Office performance was decent, with a Business Winstone score of 36.6. However, its Multimedia

Content Creation Winstone score of 40.4 was a lot lower than average. In short, the performance of the SB86i was



disappointing. This, plus the noise issues, means we'd be inclined to give this one a miss.

— Nick Mailath

TEST RESULTS

VeriTest Business Winstone	36.6
VeriTest Multimedia Content Creation Winstone	40.4
Unreal Tournament 2003 average/low fps	58.6/24
DOOM 3 timedemo demo1 average fps	6.3

Canon PIXMA iP8500

Canon has come out with another top-drawer printer that offers almost the same value as the i9950 we previously tested, but without the high price tag.

The new iP8500 is an impressive box of tricks, printing colour photos with eight colour inks, all with their own individual tanks. The tanks are quite sizeable, and are separate from the print head, which can also be removed. There are two paper options: a front-loading cassette or a top-loading autotray.

You've also got plenty of input options including two

dedicated USB 2.0 and USB 1.1 ports, plus a PictBridge port. PictBridge allows you to connect your camera and print your favourite shots without going near your PC. Thankfully, printer setup is easy, and even the print head alignment mechanism is a snap — just print a page and you're done. No guesswork, no quality judgments.

One area where we thought things could be improved was the print speed. The iP8500 did a great job on our 8MB Photoshop test image, spitting it out in 37.5 seconds; however, it



took 22.3 seconds to get out a single page of text. Canon rates the print speed at 17 pages per minute (ppm) mono and ⦿

Price: \$599 Contact:
Canon Phone: (02)
9805 2000 Web: www
.canon.com.au • Eight-colour
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JetFlash 110

Transcend JetFlash110 new high-speed USB2.0 JetFlash series have high quality outlook and sliding USB port design. It is not only easy to carry and more flexible to use with USB peripheral devices, but also an ultimate data storage device that can bring users the worry-free data storage and transfer experience.

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JetFlash 110, 2A, 2B



TS2GJF2A

TS2GJF2B

TS2GJF10

Transcend's USB2.0 high speed JetFlash is easy to carry and flexible to use with USB peripheral devices. It's an ultimate data storage device.

JetFlashM & JetFlash MP3



TS256MFLASHM

TS1GJF-MP3

Combines a high speed USB2.0 Flash Drive with MP3 Player, AB repeater, Voice recorder and FM radio functions. It is a great companion for your digital life.

DDR2



TS128MLQ64V5J

DDR2 is the technology that enables the DDR2 SDRAM chip to run 2 times faster than DDR SDRAM in bandwidth. Including several new features in DDR2 fulfills the speed and bandwidth improvements.

Digital Album



TS25PSP20G

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15ppm colour, which is slow for a printer of this class, but it's clear that quality is the main name of the game for the iP8500.

And the print quality is well worth the wait. With eight

primary inks and droplets as small as two picolitres, even plain paper doesn't pose much of a problem. A top resolution of 4,800 by 2,400dpi means precision isn't a problem either.

Text quality on plain paper was good, but just showed a tiny amount of bleeding to take the straight edge off things. That aside, it still managed to get through a 10-page text

document in two minutes 48 seconds.

All up, at \$599, this is as close to my ideal of the perfect printer as we've seen so far.

— Darren Yates

Canon Digital IXUS i5

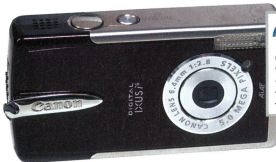
Canon is certainly making a go of its Digital IXUS range, with the new IXUS i5 the latest release. It's a compact autofocus point-and-shoot type camera with a 5-megapixel (MP) 0.4in sensor and a fixed 35mm (35mm equivalent) lens.

Focus is from 10cm to infinity in normal mode and 3cm to 10cm in macro mode. Digital zoom is available via controls on the rear of the camera up to 6.5X, but remember, using digital zoom simply throws away resolution, and you can do the same thing in software later.

The i5 features a built-in

flash and removable rechargeable Lithium Ion battery. It also supports PictBridge, so you can connect it to any PictBridge-ready printer and print out your favourite shots without a PC. It also comes with a 32MB SD memory card, which is enough for 11 high-resolution, high-quality shots or up to 42 seconds of 640 by 480-pixel/10fps MJPEG video with sound (although you can only take 30 seconds in one hit).

Unfortunately, the shots from our test unit were quite poor. Closeups of the actual images revealed copious



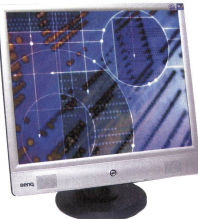
Price: \$549
Contact:
Canon Phone:
(02) 9805 2000 **Web:**
www.canon.com.au
+ 5MP sensor
+ No optical zoom
+ Poor image quality

amounts of JPEG compression artefacts and general noise.

It's nicely priced at \$549, but there's not enough here in either features or true value to take this camera seriously. If you're looking for a fashion accessory, this might suit, but if you want to take photos, Canon has better cameras than this.

— Darren Yates

BenQ FP71E+



One of the great conundrums we've seen with LCD monitors in *PC User* Labs is their inability to offer both fast response times and wide-angle peripheral views. You can get one or the other, but not both.

Enter BenQ's new FP71E+ 17in TFT LCD unit with an acclaimed 8ms response time —

Price: \$549 **Contact:**
BenQ Phone: (02) 9352
8800 **Web:** www.benq.com.au + Fast response for
games — Very poor peripheral
viewing angle — Pink colouring

currently the fastest of any LCD monitor available. Its styling is generally clean, although its odd proportions tend to play tricks on your eyes, making the screen's actual 5:4 proportions appear more square. Its native resolution is 1,280 by 1,024 pixels and comes with almost the same visual area as most 19in CRT screens.

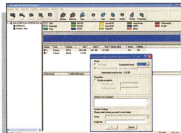
Testing it with DOOM 3 at its native resolution really gave the monitor a tough workout in terms of update speed. The results were as good as we've seen from any TFT monitor in the last 12 months, at least in terms of response time.

The problem with the our sample unit was its extremely poor viewing angle — even looking directly at the centre of the screen, the top corners were hard to see correctly without a little colour inversion creeping in. Varying the viewing angle by little more than 20° below horizontal left us with serious colour inversion. We wouldn't use one of these in a media centre PC application.

The other worrying feature about our test unit was its tendency to lean towards a pink shade as soon as you moved away from the centre of the screen. That made our test unit a poor choice for desktop publishing or in any environment where colour-accurate work is demanded.

All up, the bottom line is that while the FP71E+ is fast, we can only say that our test model continued the conundrum: LCD monitors can be fast or viewed at any angle, but not both.

— Darren Yates



SOFTWARE Paragon Hard Disk Manager Personal

Hard Disk Manager (HDM) consists of a variety of tools to provide you with maximum control over your hard drives. It includes the same basic features as Paragon's Partition Manager (see *PC User* March, page 24), in addition to CD/DVD burning, various backup options and a partition browser that can browse formats including Linux Ext2 and Ext3 file systems. Wizards are provided for some simple tasks like copying and backing up disks, but as with any partitioning tool, read the documentation, as mistakes can be costly with this type of software. That said, HDM includes an undelete partition option. If you're after a hard disk utility with a little more oomph, HDM should accompany your needs.

— Nick Mailath

Price: Personal,
\$US79.95; Professional,
\$US179.95 **Web:** www.paragon.ag + Comprehensive
set of tools + Good wizards
— Mistakes may be costly

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GIGABYTE™
TECHNOLOGY

ScanSoft Dragon NaturallySpeaking 8 Preferred

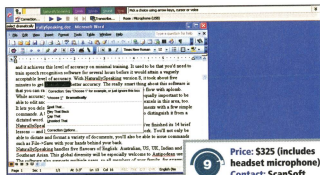
It's been about five years since I last tried speech recognition and dictation software. My last experience left me convinced this sort of software was suitable only for those with disabilities or for truly execrable typists.

Well, five years is a long time in the software business and Dragon NaturallySpeaking has come a very long way in that time. The accuracy of the software is astounding, and it achieves it on minimal training. It used to be that you'd need to train speech recognition software for several hours before it reached a vaguely acceptable level of accuracy. With NaturallySpeaking 8, it took about five minutes to get vastly better accuracy. The really smart thing about this software is that you can rattle off your words at a fine pace and it

handles the flow with aplomb.

While accuracy is vital to good speech recognition software, it's equally important to be able to edit and format your words with ease. NaturallySpeaking excels in this area, too. It lets you delete, edit and insert words, as well as navigate around documents with a few simple commands. A brief pause before a command is all that's needed to distinguish it from a dictated word.

NaturallySpeaking includes an excellent tutorial. By the time you've finished its 14 brief lessons — and I mean very brief — you'll be ready to do serious work. You'll not only be able to dictate and format a variety of documents, you'll also be able to issue commands such as File → Save with your hands behind your back.



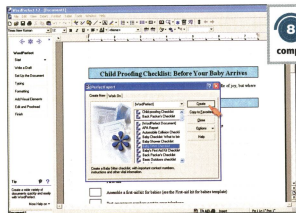
Price: \$325 (includes headset microphone)
Contact: ScanSoft
Australia Phone: (02) 9929 0377
Web: www.scansoft.com.au
» Excellent accuracy • Works with many applications • Not cheap!

NaturallySpeaking handles five flavours of English: Australian, US, UK, Indian and Southeast Asian. This global diversity will be especially welcome to Antipodean users.

As a last aside, this review was dictated in its entirety using Dragon NaturallySpeaking 8. I only needed to correct two errors in the whole review.

With the disappearance of most of NaturallySpeaking's competition, ScanSoft has this market virtually to itself. Fortunately, that seems to be no bad thing.
 — Rose Vines

Corel WordPerfect Office 12 Home Edition



Price: \$169 Contact: Corel Phone: 1800 200 065
Web: www.itdlogistics.com.au • Rock-solid word processor • Excellent Microsoft compatibility • Not much new for upgraders

these components, but add Presentations software, legal and collaboration tools and (Academic edition only) the Paradox database management system.

At the core of WordPerfect Office is the WordPerfect word processor. As Microsoft Word has become increasingly buggy — its numbering, formatting, table handling and complex document management have all suffered in recent versions — WordPerfect has maintained its reputation as a rock-solid word processor. It has a full complement of tools for handling everyday documents, but where it really shines is in editing complex documents. It handles numbered lists, tables and sub-documents far more gracefully than Word. Its 'Reveal codes' option, while somewhat intimidating to those making

the change from Word, ensures that the formatting you think you have applied to a document is the formatting you actually get. Microsoft take note.

One of WordPerfect's most interesting features is PerfectExpert. This context-sensitive help system automates a huge range of tasks in both the word processor and Quattro Pro. It's like a souped-up wizard and template manager combined, and it comes with an impressive array of pre-fab templates.

Another knock-out feature is WordPerfect's ability to publish directly to PDF format.

The big changes from the previous version are boosts in compatibility with Microsoft Office. Given the state of the market, offering solid compatibility is a must for WordPerfect, and version 12 really delivers. File conversions are excellent, and a choice of interfaces lets you opt for a Word-like environment if you're making the switch.

— Rose Vines

You have to hand it to Corel: in the face of the seemingly unstoppable Microsoft Office juggernaut, the Canadian company keeps churning out version after version of its bridesmaid suite, WordPerfect Office. In doing so, it not only provides users with a viable alternative to the Word/Excel combo, it also keeps the faith with WordPerfect devotees who, throughout the years, have found many good reasons to stick with a non-Microsoft solution.

WordPerfect Office 12 comes in a variety of flavours, including the Home Edition reviewed here, a Standard edition, and an academic version. The Home Edition packages the WordPerfect word processor, Quattro Pro spreadsheet, Personal Financial Essentials, Encyclopaedia Britannica, Photobook photo editing, PhotoAlbum, and an address book, and a few other bits and pieces. The Standard and Academic editions lack some of

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Best-value PCs under \$1,500

Darren Yates tests the latest sub-\$1,500 PCs, and finds there's no reason to spend more.

It's only been six months since we last challenged local and international vendors to come up with their best-value PCs for under \$1,500, but it's surprising how the landscape has varied in that time. While the October 2004 shootout gave us some real surprises, this month's

collection were more spread out in terms of value. But even so, there are at least two PCs here that make us wonder: do you really need to spend more than \$1,500 on a desktop PC these days?

The systems submitted by PC eXpress and TI Computers were simply outstanding, with

features and horsepower to burn. A DVD burner is now almost standard at this price, but when you add in GeForce 6600 GT graphics cards and a 160GB (or larger) hard disk, all powered by an Athlon 64 3200+ processor for just \$1,500, we're not sure what else you could possibly want.

PC eXpress Avatar 3200-64

Local vendor PC eXpress has launched into 2005 with a rocket called the Avatar 3200-64, and it's the most feature-rich PC we've ever seen at this price point. It all starts with AMD's Athlon 64 3200+ processor and 512MB of memory running on the impressive ASUS K8V-X motherboard. Even more impressive were the storage components: a 200GB Seagate hard disk drive accompanied by dual DVD drives, including Samsung's TS-H552B dual-layer burner.

But most impressive of all was the GeForce 6600 GT

graphics card. And when we ran the 3D game DOOM 3, it averaged 76.3 frames per second (fps), confirming that the Avatar 3200-64 had set new levels of value and performance in this price bracket.

The Seagate drive is an ATA/100 type, rather than the more modern Serial ATA drives we saw in other systems, and it certainly wasn't the fastest drive here. However, that counted for little overall, with the system turning in good application performance, and we'd happily settle for 200GB of disk space any day.



Price: \$1,490 Contact: PC eXpress Phone: (02) 9584 0567
Web: www.pc-express.com.au + 200GB hard drive
+ GeForce 6600 GT graphics card – No FireWire

The only feature this PC lacks is FireWire for connecting a digital camcorder, but that's easily added with a \$40 FireWire card. Some might also want a bigger monitor, although Samsung's 17in SyncMaster 793DF flatscreen CRT monitor does a fine job with games and movies. PC eXpress also throws in a pair of stereo speakers.

With plenty of power to handle any new game or application, the Avatar 3200-64 is the best \$1,500 PC we've seen.



TI Computers TI AMD Deluxe 1500

TI Computers can consider themselves unlucky this month: they ran up against some very hot competition from PC eXpress. That said, the TI AMD Deluxe 1500 is an excellent system in its own right. The system includes AMD's Athlon 64 3200+ CPU, which is as good as you'll see at this price. Combined with 512MB of memory and Gigabyte's GA-K8NS motherboard, it produced the best performance in this feature

with multimedia applications. Despite that, it couldn't quite push its Leadtek GeForce 6600 GT graphics card to the same levels as the PC eXpress system. It also has a smaller (though still generous) 160GB hard drive and only a single DVD drive, although it's LG's excellent GSA-4163B dual-layer burner. This one also lacks FireWire support, which is a pity as it would be ideal as a digital video workstation (it's not something a \$40 card can't fix,

though). Samsung's 17in SyncMaster 793 flatscreen CRT monitor gets another run here.

All up, this is an excellent overall performer with games and applications, and would keep anyone happy for a long time.



Price: \$1,499 Contact: TI Computers Phone: (02) 9437 5437
Web: www.ticomputers.com.au
+ 160GB hard drive + GeForce 6600 GT graphics card – No FireWire



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2005 National Award of Excellence



2005 National Award of Excellence



2005 Taiwan Technology Fair Award



2005 Best Choice Award (AUS) 2005/12/12

Marvel Computers Thoroughbred 3000A

The Thoroughbred 3000A has one advantage over the two leading systems: a FireWire port. That, combined with good performance on multimedia applications, makes this the best all-round system that is digital video ready, straight out of the box. It's also the first system we've seen to feature a motherboard with nVidia's new nForce4 chipset. The Gigabyte GA-K8NF-9 board combines a PCI Express graphics slot and Athlon 64 Socket 939 processor platform, which we suspect has a longer upgrade path for future processors than the Socket 754

Athlon 64 motherboards seen in this month's top two systems.

Unfortunately, Marvel has had to compromise a little with the processor and graphics card. Consequently, the Athlon 64 3000+ and non-GT version of the GeForce 6600 produced a significantly lower DOOM 3 score than the two leading systems. That said, the system is still good enough to keep you happily playing the latest 3D games.

The 160GB Western Digital hard drive showed almost every other system a clean pair of heels (with the exception of

Reda's RAIDed Drives), scoring an average data transfer speed of 10,200KB per second. And with LG's F700B 17in flatscreen CRT, you've got a good monitor for gaming and video. LG's 16x GSA-4160B DVD burner will burn just about anything, and Marvel even includes a 2.1 (two satellites and a subwoofer) speaker system.

All up, the Thoroughbred 3000A is a very good all-round system with upgrade potential, and you won't have to spend a cent extra (apart from the camcorder, of course) if you want to get into digital video.



Price: \$1,495 Contact: **Marvel Computers** Phone: (02) 9680 9688 Web: www.marvelcomputers.com.au + FireWire port + 160GB hard drive - Standard GeForce 6600 graphics card

OTHER SYSTEMS TESTED

Rectron Gigabyte MB92-K8VM800M

Rectron submitted this Athlon 64 system based mostly around Gigabyte gear and it's generally good value, except if you're into 3D gaming. Its integrated graphics couldn't even cope with our older test game, Unreal Tournament 2003. However, the inclusion of Gigabyte's 17in TFT LCD monitor will make it attractive to many, and Windows XP Professional makes it well suited to business users. Western Digital's 120GB hard drive is a little light on compared to others in this feature, but it's fast and should be sufficient for most users. Gigabyte's dual-layer DVD burner and good all-round application performance add further to the appeal. There's no FireWire port, but Rectron's



Price: \$1,449 Contact: **Rectron** Phone: (03) 9561 6166 Web: www.rectron.com.au + 17in TFT LCD - Integrated graphics

pricing is such that a FireWire card should still keep the overall price under \$1,500.

while the 160GB hard drive and Samsung TS-H552B dual-layer DVD burner are generous for the price. The AMD Athlon 64 3000+ and 1GB of memory

provide plenty of power, although we would have preferred 512MB of memory in exchange for a better graphics card.

Rectron Gigabyte MB92-8S661FX775

This second system from Rectron features the same case, 120GB hard drive, DVD burner and 17in TFT monitor as the Gigabyte Athlon 64 system (at left), but this time one is built around Intel's Pentium 4 540 processor. It also features Windows XP Pro, which again favours business use. However, the performance of this system was no better than the previous Rectron system; in fact, its office application test result was 10% slower. Integrated graphics

Price: \$1,499 Contact: **Rectron** Phone: (03) 9561 6166 Web: www.rectron.com.au + 17in TFT LCD monitor - Integrated graphics



again knock this one out of the 3D gaming race. The other difference between these two Rectron systems is price: we'd save ourselves \$50 and go for the Athlon 64 system instead.

PC Quest Stigma X

The Stigma X comes close to matching the leading systems, except in 3D gaming. The ATI Radeon 9600 XT graphics chip is fine for older games, but it will struggle on many recent games. On DOOM 3, it barely scraped past 25fps at 1,024 by 768-pixel resolution. The inclusion of FireWire makes this system better suited to digital video,



Price: \$1,500 Contact: **PC Quest** Phone: 1300 550 118 Web: www.pcquest.com.au + FireWire - Radeon 9600 XT graphics

Reda Computer Technology Samoy 200

The Samoy 200 is an interesting system, incorporating two 80GB Seagate Barracuda drives in a RAID. As well as forming a 160GB super-drive, this setup produced the highest average data transfer speed of all the systems tested, at 12,100KB/second. However, this system is more suited to business

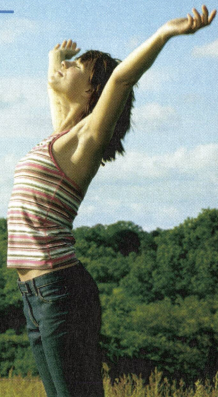
Price: \$1,499 Contact: **Reda Computer Technology** Phone: (02) 9816 3188 Web: www.reda.com.au + 160GB RAID - GeForce FX 5200 graphics



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www.ple.com.au

TAS:

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SUB-\$1,500 PCs: HOW THEY COMPARE

	PC eXpress Avatar 3200-64	TI Computers TI AMD Deluxe 1500	Marvel Computers Thoroughbred 3000A	PC Quest Stigma X	Reda Computer Technology Samoy 200	Rection Gigabyte MB92-K8VM800M	Rection Gigabyte MB92- 85661FX775	Acer Veriton 7700G
SPECIFICATIONS								
Processor	AMD Athlon 64 3200+ (Socket 754)	AMD Athlon 64 3200+ (Socket 754)	AMD Athlon 64 3000+ (Socket 939)	AMD Athlon 64 3000+ (Socket 754)	AMD Athlon 64 3000+ (Socket 939)	AMD Athlon 64 3000+ (Socket 754)	Intel Pentium 4 540 (3.2GHz)	Intel 3GHz Pentium 4E
Memory	512MB DDR400	512MB DDR400	512MB DDR400	1GB DDR400	1GB DDR400	512MB DDR400 (64MB shared)	512MB DDR400 (64MB shared)	512MB DDR400
Motherboard	ASUS K8V-X	Gigabyte GA-K8NS	Gigabyte GA-K8NF-9	ABIT NF8	Gigabyte GA-K8NS-939	Gigabyte GA-K8VM800M	Gigabyte GA- 85661FXM-775	ASOpen 915G chipset
Graphics card	Nvidia GeForce 6600 GT 128MB AGPFX	Leadtek WinFast A6600 GT 128MB	Gigabyte GV- N46256D	GeCube GC- R96XT-D3	Leadtek WinFast FX 5200 256MB	Integrated K8VM800M graphics	Integrated S5 661FX graphics	Intel integrated 915G
Graphics chip	Nvidia GeForce 6600 GT	Nvidia GeForce 6600 GT	Nvidia GeForce 6600 (PCI-E)	ATI Radeon 9600 XT	Nvidia GeForce FX 5200	As above	As above	As above
Hard disk drive	200GB Seagate Barracuda ATA/100 8MB cache	160GB Seagate ST3160827AS SATA	160GB Western Digital SATA	160GB Seagate Barracuda SATA	Two 80GB Seagate SATA	120MB Western Digital WD1200JD SATA	120MB Western Digital WD1200JD SATA	80GB Seagate ST380013AS SATA
Optical drive(s)	Samsung 16x DVD- ROM, 16x dual-layer DVD burner	LG GSA-4163B DVD burner	LG GSA-4160B DVD burner	Samsung TS- H5528 DVD burner	LG GSA-4160B DVD burner	Gigabyte GO-W1616B dual-layer DVD burner	Gigabyte GO- W1616B dual- layer DVD burner	DD1601 16x DVD burner
Monitor	17in Samsung SyncMaster 793DF Flat CRT	17in Samsung 793 flat-screen CRT	17in LG F700B flat CRT	17in Philips 107D66 flatscreen CRT	17in PolyView V17E TFT LCD	17in Gigabyte G-MAX GD-1703BP TFT LCD	17in Gigabyte G- MAX GD-1703BP TFT LCD	No monitor included
Operating system	Windows XP Home	Windows XP Home	Windows XP Home	Windows XP Home	Windows XP Home	Windows XP Professional	Windows XP Professional	Windows XP Professional
FireWire port included	No	No	Yes	Yes	No	No	No	No
TEST RESULTS								
Business Winstone 2002	37.6	38.6	37.9	39.3	39.9	37.8	34.1	31.7
Multimedia Content Creation Winstone 2003	51.1	53.8	48.6	FAIL	51.7	48.3	48.8	47.2
Business Disk WinMark 99	8430	9620	10200	8810	12100	10800	13400	9500
Unreal Tournament 2003 (1,024 by 768 pixels) average/low fps	233.7/84.8	225.1/91.6	171.7/86.5	142.5/49.4	61.8/30.4	16.0/2.9	18.9/6.1	51.0/21.3
Unreal Tournament 2003 (1,280 by 1,024 pixels) average/low fps	207.0/84.1	190.4/41.0	123.2/31.9	94.6/46.5	40.9/21.4	8.9/1.6	DNB	16.3/7.5
DOOM 3 timedemo demo1 (1,024 by 768 pixels) average fps	76.3	73.0	50.0	25.8	DNB	DNB	DNB	DNB
DOOM 3 timedemo demo1 (1,280 by 1,024 pixels) average fps	58.6	57.0	35.0	17.0	DNB	DNB	DNB	DNB
In all cases, higher scores are better.								

TECH TERMS

AGP/PCI Express. PCI Express is a new interface for graphics cards that promises to be faster than the current AGP (Advanced Graphics Port) interface. However, we've seen no evidence of any performance improvement so far. PCI Express cards need a motherboard with a compatible PCI Express expansion slot.

Chipset. A group of two chips that determine what processors, memory and graphics card the motherboard can handle, and what other features (like Serial ATA, for example) it supports.

CRT (Cathode Ray Tube). The technology used for conventional computer monitors and TV sets.

Dual-layer and other DVD formats. Up until recently, most DVD recordable drives have only been able to burn single-layer DVD-R and/or DVD+R discs with up to 4.7GB capacity. However, some new DVD burners can now record double-layer DVD+R discs with up to 8.5GB capacity. DVD-R and DVD+R are the two main competing recordable disc formats, but fortunately, most DVD burners support both formats these days.

FireWire. Officially known as IEEE 1394, this is a fast interface for

connecting devices such as digital video cameras to a PC.

Processor socket. The physical format of the main processor and the equivalent socket on the motherboard. In combination with the chipset, the socket determines what processors will work with the board.

RAID (Redundant Array of Independent Disks). A broad term that refers to a number of ways that two or more hard disk drives are used in combination. For desktop PCs, RAID 0, also known as data striping, is often used to increase disk performance.

SATA and ATA/100. SATA (Serial ATA) is a new hard drive interface offering potentially higher data transfer speeds than standard Parallel ATA drives. ATA/100 is the most common version of the Parallel ATA interface, offering a maximum of 100MB per second, compared to a potential maximum of 150MB per second for SATA, although the real-world performance differences are nowhere near that great.

TFT (Thin Film Transistor). The type of liquid crystal display (LCD) found on virtually all new notebook computers and increasingly popular as the new flat-panel monitors for desktop PCs. ☺

use than gaming, with the inclusion of a 17in TFT monitor and GeForce FX 5200 graphics chip. At least this system was able to cope with Unreal Tournament 2003, but don't expect much joy with more recent 3D games. There's no

FireWire port either, but performance with office and multimedia applications was among the best in this feature. It also offers good upgrade potential, thanks to the Socket 939 Athlon 64 motherboard, Gigabyte's GA-K8NS-939.

Acer Veriton 7700G

Full marks to Acer for being the only international brand to submit a system for this feature. However, the Veriton 7700G comes with no monitor at this price, which automatically excluded it from getting a high score. Otherwise, the value seems quite reasonable for a name brand, with a 3GHz Pentium 4 processor, 512MB of memory, DVD burner and Windows XP Professional included. However, with no FireWire and an 80GB hard drive only, it doesn't compare well with the local brands. The

integrated graphics were able to run Unreal Tournament 2003, but you can forget any recent 3D game. And while multimedia application performance was good, it was the slowest in this feature with office applications. 



HOW WE TESTED

We used the following benchmarks to test the systems.

- **VeriTest's Business Winstone 2002.** This tests real-world business applications such as Microsoft Office XP.
 - **VeriTest's Multimedia Content Creation Winstone 2003.** This tests high-end authoring applications such as Adobe Premiere 6.0, Photoshop 7.0 and Macromedia Dreamweaver 4.
 - **DOOM 3 timedemo demo1.** A popular 3D game that uses the most recent version of DirectX, Microsoft's multimedia instruction set for Windows. We tested the systems at two screen resolutions to see how they handle demanding new DirectX 9 games. Each result is an average frame rate, measured in frames per second (fps). Note that DNB indicates we did not run the DOOM 3 test because of the system's poor result with Unreal Tournament 2003.
 - **[H]ard|OCP's Unreal Tournament 2003 tests.** A popular older DirectX 8 action game, we supplemented the game with [H]ard|OCP UT2K3 Benchmark Utility (see www.hardocp.com). Two results are provided for each test: the average in fps for all three [H]ard|OCP maps, and the lowest frame rate produced.
 - **VeriTest's WinBench 99.** This tests hard disk performance. See www.veritest.com/benchmarks/default.asp for more on VeriTest's benchmarks.
- Unless otherwise stated, the higher the test scores, the better. (Note: these tests were performed without independent verification by VeriTest and VeriTest makes no warranties as to the results.)



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BROADBAND & VoIP SUPERGUIDE

Broadband and VoIP guide

Want to save hundreds of dollars on Internet access and phone calls? Angus Kidman and the PC User team put together this comprehensive guide to ADSL, cable and wireless broadband, and Voice over IP services.

A decade ago, broadband was only available to the lucky few with access to pay TV cable, and even they had only two choices: a cable service from Optus or Telstra. The choice for a telephone service was almost as simple. But since then, the broadband boom — and particularly the introduction of ADSL services across the majority of the country — has resulted in lots more options and dramatically lower prices. Indeed, there are now more than 700 residential broadband plans that are available to the vast majority of Australian homes.

If you're still shaking your head in wonder at how quickly the broadband market has moved, consider these additional developments:

- Wireless broadband services are now available in some capital cities at surprisingly competitive rates.
- Some broadband providers also offer conventional telephone services and are bundling them with broadband plans at attractive prices.
- Voice over IP (VoIP) phone services are now available for homes, undercutting (sometimes dramatically) the prices from conventional phone services.

● With ADSL2 recently ratified in Australia, the stage is set for new, higher-speed Internet services across the country. And while most broadband providers still mainly depend on Telstra's ADSL infrastructure, some ISPs already have begun installing their own ADSL2 infrastructure in phone exchanges, allowing them to offer better prices and performance. (There's at least one 8Mbps home ADSL2 service already available).

Together, these developments mean that you can potentially save hundreds from your Internet and phone bills over a year. To do that, however, you've got to do your homework thoroughly and wade through a huge selection of plans, and terms and conditions. And with the many bundle deals available, you can no longer afford to choose your Internet and telephone services in isolation.

Where do you start? For practical considerations, it's probably best to begin with choosing a broadband plan.

● Broadband choices

There are a number of technologies that deliver broadband to Australian homes, but for most people, ADSL, which adds broadband capacity



Don't forget cable as a high-speed option: BigPond's Unlimited Cable plan is good value with its 10GB limit and shaping for \$59.95 per month.

to your existing phone line, remains the cheapest and most flexible broadband option. The vast majority of plans listed in our table are ADSL.

Telstra estimates that 85% of business and residential lines nationally can now access its ADSL network, and additional lines run by rival wholesalers take the figure even higher. You can check for your eligibility for ADSL on virtually any provider Web site via a simple lookup on your existing phone number.

Cable also remains a viable option for homes in selected areas of capital cities and regional centres. Your choice is limited to whoever has invested in pay TV cable in your area, but the price is actually quite reasonable and the download speed is generally outstanding. In fact, if you're looking for a high-speed broadband connection (1.5Mbps or faster), then cable is well worth considering. Just call either BigPond, Optus or your regional cable provider to see if it's available in your street.

An increasing number of

wireless providers are also now entering the broadband market with some reasonably priced plans. We've dealt with these providers in more depth on page 48.

For remote users and (more rarely) people in difficult-to-access metropolitan or rural locations, satellite remains the best choice. While satellite can theoretically be installed anywhere, costs vary hugely depending on location.

Remote users contemplating satellite should check to see if they are eligible for subsidies under the Higher Bandwidth Incentive Scheme (HiBIS) to encourage broadband use (details can be found at http://www.dcta.gov.au/tel/higher_bandwidth_incentive_scheme_hibis).

One issue both cable and satellite users need to consider is that cabling and equipment may disrupt existing buildings. If you're renting or living in an apartment, you may need permission from your landlord or body corporate before installation.



BROADBAND & VoIP SUPERGUIDE

Which ISP?

While we've only included ISPs with an Australia-wide offering in our listings here, that shouldn't be taken as implying that local ISPs aren't worthy of your attention; there's simply far too many of them to list in a national magazine. Many of the best local providers are in somewhat surprising locations. Western Australia and the ACT, in particular, have a huge range of choices relative to the overall size of their populations.

With that said, many of the ISPs on the list are in effect regional operations that are now reaching out to a wider market. It's worth checking on the location of your ISP; while it may not bother you to discover your provider is in Perth while you're in Victoria, bear in mind that time differences could make accessing tech support more difficult if you need it. An ISP located closer to home will also be able to visit you onsite in the case that your home or office requires a particularly difficult installation.

Word of mouth remains probably the most effective means of discovering good local ISPs; ask around among friends and colleagues, and check newsgroups and forums on sites such as www.whirlpool.net.au.

Which broadband plan?

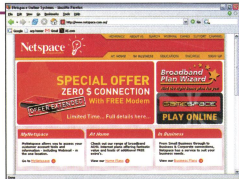
Now to the hard part: choosing a plan. Here's a guide to the most important criteria to look for in a broadband plan.

● **Connection speed.** For most users, the three most popular speeds for residential ADSL plans are: 256/64Kbps (for basic

browsing and email), 512/128Kbps (the minimum for regular downloading and file sharing) and 1,500/256Kbps (for heavy users). The first figure in each refers to the download speed (for accessing email, viewing Web sites and receiving shared files), and the second to the upload speed (for sending mail and sharing your own files). Cable services offer even faster speeds, but are again asymmetrical, with much faster download speeds than upload speeds. Also bear in mind that these are maximum speeds that you'll rarely achieve in practice. If you're trying to access an in-demand site, it may be just as slow with a 1,500/256Kbps connection as a 256/64Kbps link. However, overall, those who do a lot of downloading or file sharing will be better off stretching their budget to a 512/128Kbps plan or faster.

● **Data limit.** This generally refers to the amount of data you download each month, but read the fineprint carefully: some plans include uploads as well as downloads in the data limit, while others include either downloads or uploads, whichever is larger. This won't have huge an impact on those who mainly just browse or download, but it will affect those who send lots of files (via email or FTP) and who are into file sharing. Sub-£30 plans offer no more than a 500MB data limit, which may be satisfactory for casual browsing and email. But to put that figure into perspective, downloading the demo of the popular game DOOM 3 will almost reach 500MB by itself, which is why we recommend a much higher

Netspace's 256 (M) plan is the best-value budget plan around, offering a generous 5GB download limit and shaping for under £40 per month.



data limit, even for family PCs.

Quite a few providers still offer peak and off-peak plans, where separate totals are maintained for access at different times of day (off-peak is typically between midnight and 7am). We haven't included this data in our details here, primarily because overnight access is only useful if you are heavily into file sharing or are running your own Web server.

Another factor is that some ISPs do not include particular kinds of data in download totals. Common examples include information accessed through various peering networks, shared between users of the same ISP, mirrored by the ISP from popular download sites such as Tucows, or used for playing games through specific networks. If you know you will want to make heavy use of, say, online gaming, then it's worth seeking out these kinds of deals. But for general Web surfing and email, they make little practical difference.

● **Excess fees or shaping.** This is still the biggest catch with many broadband plans, particularly those budget plans with a monthly limit of 200MB or 300MB, and hefty penalty fees of 15 cents or more per extra megabyte. Download the DOOM 3 game demo we mentioned above and you could end up doubling your monthly fee in one go! If you must go for a plan with penalty fees, at least choose one that puts a reasonable monthly cap on the penalty. However, we much prefer plans that drop the connection speed (called 'shaping'), rather than adding a penalty fee, if you exceed

TECH TERMS

ADSL (Asymmetric Digital Subscriber Line). DSL technology transforms a conventional phone line into a high-speed broadband connection. Asymmetrical DSL, the type of residential service we have in Australia, means that speed varies according to the direction it's going. Download speeds are usually much faster than upload speeds.

Cable Internet. A type of broadband technology that uses pay TV network cable. **DSLAM (DSL Access Multiplexer).** A device that sits in a telephone exchange to accept incoming DSL connections from residences and businesses.

IP address. Every computer and device on an IP (Internet Protocol) network must have a unique IP address so that the devices can communicate with each other.

SDSL (Symmetric DSL). A type of DSL service where the upload and download speeds are the same. Used only for businesses and others who send a lot of data.

Softphone. VoIP software that acts like a virtual telephone on your PC.

VoIP (Voice over IP). Technology for sending and receiving voice transmissions over any IP (Internet Protocol) network, such as the Internet itself.

ON THE COVER DISCS

On this month's cover discs, we've included details of all 700 national residential broadband plans that we assessed for this feature.



Internode's sub-£30 plan is great value, with a 500MB download limit and no penalty fees.



BROADBAND & VOIP SUPERGUIDE

the download limit. The shaped download speed is typically 64Kbps and sometimes 28Kbps (again, check the fingerprint), but at least with shaping you won't be hit with any nasty surprises in your bill.

You should also be aware that policies for shaping are variable. Some providers reserve the right to apply shaping once limits are exceeded, but won't necessarily do so every month (so-called 'soft shaping'). Acceptable usage policies invariably gives ISPs the right to restrict access to customers whose download behaviour is significantly larger than other users, even if they are on a so-called 'unlimited' plan.

● **Minimum term.** Your best protection against being locked into a poor-value deal is not to be tied into a long-term contract. The vast majority of broadband deals now include a six-month contract, which is in large part due to a Telstra policy that fines customers who drop such a plan any earlier. ISPs with shorter contract lengths are either connecting to a non-Telstra network or taking a calculated risk that you won't in fact quit early. While some ISPs boast that they have no contracts, anyone who charges a termination fee or similar — and almost every provider does — is effectively enforcing a contract term.

Given the prevalence of six-month contracts, you should approach any ISP demanding a 12- or 24-month commitment with caution, even if they are offering drastically reduced installation fees. Also check the terms that apply once your initial contract expires — while most providers will let you

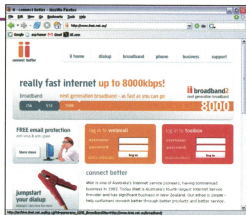
continue on a month-to-month basis, some work on the basis of a three-month rolling contract.

● **Rapid Transfer Process support.** Also known as 'churning', this is an arrangement between ADSL providers that allows users to switch to and from other supporting providers a lot more cheaply and easily. You'll find a list of supporting providers at <http://bc.whirlpool.net.au/bc-list.cfm?type=fc>.

● **Connection fee and cost of the modem.** The connection fee is generally around \$100 for an ADSL service, but should be significantly less if you are switching to and from providers that support Rapid Transfer. This fee generally assumes you will install the modem and connection yourself, but if you're not comfortable with this prospect, check the availability and cost of onsite installation. The fee generally doesn't include a modem either. Most ADSL providers allow you to use most recent ADSL modems (or modem/routers for sharing the connection), but they also sell their own. It's a different case with cable services, which require their own modem and one all-encompassing fee for onsite installation, modem and connection.

● **Other conditions and charges.** Don't just read the plan details carefully, read the entire terms and conditions document before you sign up, as not all providers highlight important conditions and restrictions. For example, you may want to change plans at some point in the future, perhaps moving to a higher speed or increasing your download limit. Some (but not all) ISPs charge a fee for speed

Leading the way in ultra-speed broadband is iiNet, whose new ADSL2 plans now offer up to 8,000/1,000Kbps connection speeds, starting from just \$39.95 per month.



changes; most don't do this for download limit changes, but these may not take effect until the next calendar month.

● **Technical support.** Unless you're an expert, make sure free telephone support is available when you're likely to need it. This is particularly important for self-install ADSL plans. Check the hours; many are effectively unavailable on weekends. If your ISP is located in another state, check that they offer a freecall number, or you might find yourself on hold at expensive STD rates.

● **Email accounts and Web space.** Any decent broadband plan should include multiple email accounts (so that family members can have their own accounts, for instance) and space for hosting your own Web page. If you're keen to use the hosting space offered, check what rules apply. Some providers limit the amount of data that can be transferred from your site and, in effect, the number of visitors. Others add that number to your own download total, which can prove expensive if your page

suddenly receives a lot of traffic.

● **Extras.** ISPs offer a huge number of incentives to attract customers. One common and handy option is a free dialup account for use if the ADSL network suffers an outage. Another useful option is an online meter of data consumed; this is essential if you are on a usage-based plan.

Most home ADSL plans offer a dynamic IP address; ☎

ABOUT THE PLANS

The plan details in this feature were as accurate as humanly possible at the time of writing (early February). However, with the broadband and phone markets changing rapidly, we strongly recommend that you do your own research, too. We assessed over 700 broadband plans in making our recommendations. We only assessed residential plans available nationally; we specifically did not include business plans, satellite plans, SDSL plans or regional providers.

SUB-£20 BROADBAND PLANS: WHAT YOU GET

Provider	Plan	Download/upload speed (Kbps)	Monthly fee	Conditions	Limit (MB)	Excess (per MB)	Setup/hardware costs	Minimum contract (months)	Supports Rapid Transfer
Big Button	Flex 256	256/64	\$14.99	None	50	\$0.25	Install fee \$99 (waived for phone service customers)	12	Yes
E.Tel	E-Start	256/64	\$15.95	Capped at \$56.95/month	100	\$0.10	Install fee \$148; modems from \$110 to \$210	9	Yes
EFtel	xpand DSL 256	256/64	\$19.95	None	10	Not disclosed	Install fee \$125; modems from \$119	0	Yes
Escape Online	BC256	256/64	\$18.95	Capped at \$78.95/month	100	\$0.15	\$165 install fee; modems from \$89 to \$299; \$10/month extra without phone service	6	Yes
Hypermax	256/64	256/64	\$19.95	Capped at \$59.95/month	200	\$0.15	Install fee \$149.95; modems from \$80 to \$110	1	Yes
iPrimus	Total 256-500	256/64	\$15.00	\$19.95/month extra without phone service	500	Shaped	Install fee \$99; modem \$129; cheaper install with longer contract	12	No
iPrimus	256-200	256/64	\$19.95	None	200	\$0.15	Install fee \$99; modem \$129; cheaper install with longer contract	12	No



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SUB-\$40 BROADBAND PLANS: 26 OF THE BEST

Provider	Plan	Download/ upload speed (Kbps)	Monthly fee	Conditions	Limit	Excess	Setup/hardware costs	Minimum contract (months)	Supports Rapid Transfer
AAPT Smartchat	256K Starter	256/64	\$29.95	Phone service customers only	12,000	Shaped	Install fee \$99; modem \$129; site install \$160	12	No
AAPT Smartchat	512K Starter	512/128	\$39.95	Phone service customers only	12,000	Shaped	Install fee \$99; modem \$129; site install \$160	12	No
BigPond	200MB ADSL	256/64	\$29.95	None	200	\$0.15	Install fee \$99; modems from \$189 to \$309	12	Yes
BigPond	200M Cable	Cable	\$29.95	None	200	\$0.15	Self install: \$189 (\$249 wireless); Site install: one port \$259, wireless \$399	12	No
BIT.net	256 Freedom Starter	256/64	\$29.95	Capped at \$49.95/month	500	\$0.10	Install fee \$125; modems from \$125 to \$250	6	Yes
BIT.net	256 Freedom Standard	256/64	\$39.95	None	4,000	Shaped	Install fee \$125; modems from \$125 to \$250	6	Yes
DigiPlus	Super256	256/64	\$24.95	Capped at \$44.95	200	\$0.10	Install fee \$129; modem \$69	0	Yes
Ecomtel	256 LITE	256/64	\$29.90	Phone service customers only	300	Shaped	\$120 install fee	6	No
Ecomtel	256 Capped	256/64	\$29.90	Capped at \$49.90; phone service customers only	300	\$0.01	\$120 install fee	6	No
Ecomtel	512 LITE	512/128	\$39.90	Phone service customers only	500	Shaped	\$120 install fee	6	No
iiNet	Starter	1,500 to 8,000/ 256-1,000	\$39.95	\$10/month extra (and half download limit) without phone service. Speed depends on proximity to an iiNet DSLAM	2,000	Shaped	Install fee \$99.95; modems \$79 to \$199	6	Yes
Internode	HOME-256-Starter	256/64	\$29.95	None	500	Shaped	Install fee \$129; modems from \$219 to \$349	6	Yes
iPrimus	Total 256-12000	256/64	\$30	\$19.95/month extra without phone service	12,000	Shaped	Install fee \$99; modem \$129; cheaper install with longer contract	12	No
iPrimus	Total 512-2000	512/128	\$30.00	\$19.95/month extra without phone service	2,000	Shaped	Install fee \$99; modem \$129; cheaper install with longer contract	12	No
Nella	256 Flexi	256/64	\$39.90	None	4,000	Shaped	Install fee \$165 (includes modem)	12	Yes
Netbay	XDSL 256-BASIC	256/64	\$24.95	None	2,000	\$0.15	Install fee \$140; modems from \$65; cheaper install for longer contracts	3	Yes
Netspace	256 (M)	256/64	\$39.95	None	5,000	Shaped	Install fee \$109; modems from \$110; cheaper install for longer contracts	6	Yes
OptusNet	DSL Basic	256/64	\$29.95	\$20/month extra without phone service	200	Shaped	Install fee \$239	12	Yes
OptusNet	Cable Basic	Cable	\$29.95	\$20/month extra without phone service	200	Shaped	Install fee \$279; modem \$80	12	No
OzEmail	OzE256 Starter	256/64	\$29.95	None	300	Shaped	Install fee \$99	6	No
Primus-AOL	Freedom Essential 256	256/64	\$34.95	None	500	Shaped	Install fee \$149; modem \$129 (cheaper install for longer contract)	3	No
Spin	H512	512/128	\$28.95	None	10,000	\$0.15	Install fee \$169; modems from \$130 to \$380 (cheaper install for longer contracts)	1	Yes
Spin	256C	256/64	\$39.95	None	3,000	Shaped	Install fee \$169; modems from \$130 to \$380 (cheaper install for longer contracts)	1	Yes
Vintek	256k Graphite	256/64	\$29.95	None	500	Shaped	Install fee \$129	6	Yes
Web Ace	Starter 256k	256/64	\$28.95	Capped at \$58.95	250	\$0.15	Install fee \$99; modems from \$119 to \$199	6	Yes
Wild Internet	256/64	256/64	\$29.95	Capped at \$50/month	200	\$0.10	Install fee \$149; modems \$199 to \$499 (cheaper install for longer contracts)	12	Yes

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every time you log on, your PC will have a different address. You can get a permanent (static) IP address (necessary if you want to run a Web server) from many providers, although virtually all charge a few dollars extra per month for the privilege.

Many ISPs also offer virus and spam filtering for their email, which can be a useful supplement to your own PC security systems. Some companies offer phone cards or hardware giveaways. These may be appealing, but shouldn't distract you from the fundamentals of the plan on offer.

● **Monthly fee.** For most broadband users, this is the final deciding factor. The main traps are penalty fees, but there a few other things to watch for. You may still come across the odd plan that charges more for non-metropolitan areas. These are now a small minority, so those in rural areas should give these plans a miss.

Also check what methods of payment your provider will accept. Some charge an extra fee for credit card payments. Many smaller providers also demand one month's access fee upfront as a security deposit. A few providers give discounts to war veterans and Seniors Card holders, or pledge to donate a percentage of account fees to named charities. One other tip: make sure the prices are GST inclusive. Legally, providers aren't supposed to advertise GST-exclusive prices, even to businesses, but several still do.

● **Best budget plans**

We've trawled through over 700 national

residential broadband plans to find the best-value options. Of course, with the market changing so quickly, we strongly advise that you do your own research, too. But with that caveat out of the way, here are our recommendations, starting with budget plans.

At the extreme low end, the sub-\$20 plans may be tempting, but be very careful if you're considering one. The only half-decent standard plan we found was E.Tel's E-Start 256/64Kbps plan, which has a \$15.95 monthly fee and 10 cents per MB excess fee, capped at \$56.95 per month. However, its measly 100MB download limit makes it suitable for casual browsing and emailing only.

Much more appealing is iPrimus' Total 256-500 plan with its 500MB download limit and shaping for \$15 per month. However, this price is exclusive to its phone customers (the monthly fee more

WELCOME TO ADSL2

With ADSL2 recently ratified in Australia by the Australian Communications Industry Forum (ACIF), the stage is set for new higher-speed Internet services across the country — pending, of course, the willingness of service providers to upgrade their networks.

ADSL2 is a relatively new standard that is designed to extend the range and speed of ADSL lines. At present, we use ADSL1, which has a maximum theoretical capacity of 12Mbps over short distances from the exchange (with diminishing capacity the further away you move from the exchange), although existing Telstra services only support up to 1.5Mbps. ADSL2 is designed primarily to increase the robustness of the line and reduce interference. It gives a slightly higher speed, but more importantly, can work at higher speeds further away from the exchange.

ADSL2+ is perhaps the more interesting standard. In addition to the robustness of ADSL2, it effectively doubles the bandwidth of the line over short distances. Theoretically, if you live within 1.5km of the exchange, you could get speeds of up to 24Mbps downstream. It's more likely that 2, 4 and 8Mbps services will be the standard offerings on ADSL2+ lines.

At the time of writing, Telstra management was planning to deliver a \$1.5 billion dollar proposal to upgrade the existing data networks. Part of the upgrade would include building support for ADSL2+ into all the exchanges around the country. The Telstra endgame is to construct what it is calling a multi-service network. The network will be designed to handle high-speed video (even over copper), digital voice and Internet access, with speeds up to 8Mbps and more for residential users.

As yet, the timeframe for the upgrade is unclear, and may depend on demand for high-speed services. Telstra will almost certainly cherry-pick areas of high demand as the first targets for the upgrade.

Meanwhile, a number of third-party broadband service providers are taking matters into their own hands. In 2004, a small set of ISPs including iPrimus, iNet and Internode, began installing their own DSL Access Multiplexers (DSLAMs) onto local exchanges. With their own DSLAMs (while everybody else uses Telstra DSLAMs), these companies have the capacity to offer ADSL2 and 2+ services right now (and many already offer ADSL1 services at higher speeds than are offered on Telstra DSLAMs). Unfortunately, the number of exchanges supported by the ISPs is still quite limited, and it's a bit of a lottery as to whether a given area has access.

Still, if you're buying a new ADSL router, it's worth looking into ADSL2 and ADSL2+ support. There's little cost premium, ADSL2/2+ modems work just fine on ADSL1 (ADSL2 is backwards compatible, if you like), and you'll be future-proofed against the upcoming network changes.

— Nathan Taylor

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Ⓢ SUB-\$60 BROADBAND PLANS: 38 OF THE BEST

Provider	Plan	Download/upload speed (Kbps)	Monthly fee	Conditions	Limit (MB)	Excess (per MB)	Setup/hardware costs	Minimum contract (months)/Minimum contract (months)	Supports Rapid Transfer
AAPT Smartchat	256K Max	256/64	\$44.95	\$15/month extra without phone service	12,000	Shaped	Install fee \$99; modem \$129; site install \$160	12	No
Ask Aussie	Thrifty Unlimited 256	256/64	\$48.95	None	15,000	Shaped	Install fee \$129.95; modems from \$74.95 to \$205; site install from \$99	6	Yes
Aztec ISP	512/128	512/128	\$49.95	None	25,000	Shaped	Install fee \$99.95	3	Yes
BigPond	Unlimited ADSL	256/64	\$59.95	\$10/month extra without phone service	10,000	Shaped	Install fee \$99; modems from \$189 to \$309	12	Yes
BigPond	Unlimited Cable	Cable	\$59.95	None	10,000	Shaped	Self install: \$189 (\$249 wireless); site install: one port \$259, wireless \$399	12	
BIT.net	512 Freedom Standard	512/128	\$44.95	None	6,000	Shaped	Install fee \$125; modems from \$125 to \$250	6	Yes
BIT.net	512 Freedom Deluxe	512/128	\$59.95	None	18,000	Shaped	Install fee \$125; modems from \$125 to \$250	6	Yes
Come On Aussie	Unlimited Flat Rate DSL	256/64	\$42.95	None	15,000	Shaped	Install fee \$125; modems from \$85 to \$125	6	Yes
Come On Aussie	Unlimited Flat Rate DSL	512/128	\$54.95	None	25,000	Shaped	Install fee \$125; modems from \$85 to \$125	6	Yes
Curl Internet	512/128kbps	512/128	\$49.95	None	25,000	Shaped	Install fee \$100; modems from \$49	6	Yes
DCSI	256/64 C20	256/64	\$49.95	None	20,000	Shaped	Install fee \$125; modems \$109	6	Yes
E-SOUL	256K UL	256/64	\$49.95	None	15,000	Shaped	\$129 install fee; modems from \$69 to \$99	6	Yes
E-SOUL	512K UL	512/128	\$59.95	None	25,000	Shaped	\$129 install fee; modems from \$69 to \$99	6	Yes
FunnelWeb Internet	Flat 1	256/64	\$49.95	None	5,000	Shaped	Install fee \$149.95	6	Yes
Hotkey	256K/64K	256/64	\$49.95	None	10,000	Shaped	Install fee \$99; modem \$99 (free with longer contracts)	1	Yes
Hyllinx	Super 256/64	256/64	\$49.95	None	15,000	Shaped	Install fee \$129; modems \$90 to \$295	12	Yes
iiNet	Light	1,500 to 8,000/256 to 1,000	\$49.95	\$10/month extra (and half download limit) without phone service. Speed depends on proximity to an iiNet DSLAM	10,000	Shaped	Install fee \$99.95; modems \$79 to \$199	6	Yes
Intermode	HOME-256-Standard	256/64	\$49.95	None	16,000	Shaped	Install fee \$129; modems from \$219 to \$349	6	Yes
Intermode	HOME-512-Standard	512/128	\$59.95	None	16,000	Shaped	Install fee \$129; modems from \$219 to \$349	6	Yes
iPrimus	Total 512-12000	512/128	\$50	\$19.95/month extra without phone service	12,000	Shaped	Install fee \$99; modem \$129; cheaper install with longer contract	12	No
Nella	512 Flexi	512/128	\$59.90	None	12,000	Shaped	Install fee \$165 (includes modem)	12	Yes
Netspace	512 (M)	512/128	\$49.95	None	5,000	Shaped	Install fee \$109; modems from \$110; cheaper install for longer contracts	6	Yes
Netspace	512 (L)	512/128	\$59.95	None	10,000	Shaped	Install fee \$109; modems from \$110; cheaper install for longer contracts	6	Yes
OptusNet	DSL Value	512/128	\$49.95	\$20/month extra without phone service	1,000	Shaped	Install fee \$239	12	Yes
OptusNet	Cable Value	Cable	\$49.95	\$20/month extra without phone service	1,000	Shaped	Install fee \$279; modem \$80	12	
OzEmail	OzE256 Unlimited	256/64	\$49.95	None	12,000	Shaped	Install fee \$99	6	No
Primus-AOL	Freedom Max 256	256/64	\$49.95	None	12,000	Shaped	Install fee \$149; modem \$129 (cheaper install for longer contract)	3	No
QConnect	LightSpeed II	256/64	\$49.95	None	15,000	Shaped	Install fee \$129; modem \$99	1	Yes
Schaelec Internet	Basic 256K/64K	256/64	\$46.95	None	15,000	Shaped	Install fee \$120	6	Yes
Schaelec Internet	Mega 512K/128K	512/128	\$58.95	None	25,000	Shaped	Install fee \$120	6	Yes
Spin	256U	256/64	\$49.95	None	15,000	Shaped	Install fee \$169; modems from \$130 to \$380 (cheaper install for longer contracts)	1	Yes
Spin	512U	512/128	\$59.95	None	15,000	Shaped	Install fee \$169; modems from \$130 to \$380 (cheaper install for longer contracts)	1	Yes
TeeGee Internet	256 Amphibian	256/64	\$44.95	None	15,000	Shaped	Install fee \$89	2	Yes
TeeGee Internet	512 Home Pack	512/128	\$58.95	None	25,000	Shaped	Install fee \$89	2	Yes
TPG Internet	1.5Mb Value Unlimited	1,500/256	\$49.95	None	20,000	Shaped	Install fee \$129	6	Yes
Tropical North	ADSL-RES-256	256/64	\$49	None	25,000	Shaped	Install fee \$109	12	Yes
Vintek	256K Copper	256/64	\$49.95	None	16,000	Shaped	Install fee \$129	6	Yes
Vintek	512K Copper	512/128	\$59.95	None	16,000	Shaped	Install fee \$129	6	Yes

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HIGH-SPEED BROADBAND PLANS: 34 OF THE BEST

Provider	Plan	Download/ upload speed (Kbps)	Monthly fee	Conditions	Limit (MB)	Excess (perMB)	Setup/hardware costs	Minimum contract (months)	Supports Rapid Transfer
AAPT Smartchat	1500K Max	1,500/256	\$89.95	\$40/month extra without phone service	12,000	Shaped	Install fee \$99; modem \$129; site install \$160	12	No
Ask Aussie	Thrifty Unlimited 1.5m	1,500/256	\$98.95	None	35,000	Shaped	Install fee \$129.95; modems from \$74.95 to \$205; site install from \$99	6	Yes
Aztec ISP	1500/256	1,500/256	\$89.95	None	35,000	Shaped	Install fee \$99.95	3	Yes
BigPond	Unlimited Cable	Cable	\$59.95	None	10,000	Shaped	Self install: \$189 (\$249 wireless); site install: one port \$259, wireless \$399	12	No
BigPond	Unlimited ADSL	1,500/256	\$99.95	\$10/month extra without phone service	N/A	Shaped	Install fee \$99; modems from \$189 to \$309	12	Yes
BIT.net	1.5 Freedom Standard	1,500/256	\$79.95	None	8,000	Shaped	Install fee \$125; modems from \$125 to \$250	6	Yes
BIT.net	1.5 Freedom Deluxe	1,500/256	\$99.95	None	24,000	Shaped	Install fee \$125; modems from \$125 to \$250	6	Yes
Come On Aussie	Unlimited Flat Rate DSL	1,500/256	\$89.95	None	35,000	Shaped	Install fee \$125; modems from \$85 to \$125	6	Yes
Curl Internet	1.5mbps/256Kbps	1,500/256	\$99.95	None	35,000	Shaped	Install fee \$100; modems from \$49	6	Yes
D2 Internet	Liberty 1.5 Flatrate	1,500/256	\$99.95	None	10,000	Shaped	Install fee \$119; modems from \$99 to \$299	6	Yes
DigiPlus	Unlimited 1500	1,500/256	\$99.95	None	10,000	Shaped	Install fee \$129; modem \$69	0	Yes
EfTel	eDSL 1500	1,500/256	\$99.95	None	40,000	Shaped	Install fee \$125; modems from \$119	0	Yes
encomm	EN-1500-UL	1,500/256	\$89.95	None	10,000	Shaped	\$129.95 install fee	3	Yes
E-SOUL	1500K UL	1,500/256	\$99.95	None	35,000	Shaped	\$129 install fee; modems from \$69 to \$99	6	Yes
Hyllinx	Ultra 1500/256	1,500/256	\$99.95	None	35,000	Shaped	Install fee \$129; modems \$90 to \$295	12	Yes
iiNet	Medium	1500-8000/256-1000	\$69.95	\$10/month extra (and half download limit) without phone service. Speed depends on proximity to an iiNet DSLAM	20,000	Shaped	Install fee \$99.95; modems \$79 to \$199	6	Yes
iiNet	Heavy	1,500 to 8,000/256 to 1,000	\$89.95	\$10/month extra (and half download limit) without phone service. Speed depends on proximity to an iiNet DSLAM	40,000	Shaped	Install fee \$99.95; modems \$79 to \$199	6	Yes
Intermode	HOM-1500-Standard	1,500/256	\$89.95	None	16,000	Shaped	Install fee \$129; modems from \$219 to \$349	6	Yes
iPrimus	Total 2000-12000	2,000/384	\$49.95	Only available to new customers located within 1.5km of a Primus-enabled exchange	12,000	Shaped	Install fee \$99; modem \$129; cheaper install with longer contract	12	No
iPrimus	Total 1500-12000	1,500/256	\$100	\$19.95/month extra without phone service	12,000	Shaped	Install fee \$99; modem \$129; cheaper install with longer contract	12	No
Nella	1500 Flexi	1,500/256	\$89.90	None	12,000	Shaped	Install fee \$165 (includes modem)	12	Yes
Netspace	1500 (M)	1,500/256	\$74.95	None	5,000	Shaped	Install fee \$109; modems from \$110; cheaper install for longer contracts	6	Yes
Netspace	1500 (L)	1,500/256	\$84.95	None	12,000	Shaped	Install fee \$109; modems from \$110; cheaper install for longer contracts	6	Yes
OptusNet	Cable Unlimited	Cable	\$69.95	\$20/month extra without phone service	12,000	Shaped	Install fee \$279; modem \$80	12	No
OptusNet	DSL Unlimited	1,500/256	\$98.95	\$20/month extra without phone service	12,000	Shaped	Install fee \$239	12	Yes
OzEmail	OzE1500 Unlimited	1,500/256	\$99.95	None	12,000	Shaped	Install fee \$99	6	No
Primus-AOL	Freedom Lightning 2000K+	2,000/384	\$49.95	None	12,000	Shaped	Install fee \$149; modem \$129 (cheaper install for longer contract)	3	No
QConnect	Enterprise II	1,500/256	\$99.95	None	35,000	Shaped	Install fee \$129; modem \$99	1	Yes
Schaelec Internet	Gigga 1500k/256k	1,500/256	\$88.95	None	35,000	Shaped	Install fee \$120	6	Yes
Spin	1.5U	1,500/256	\$89.95	None	15,000	Shaped	Install fee \$169; modems from \$130 to \$380 (cheaper install for longer contracts)	1	Yes
TeeGee Internet	1500 Monster Pack	1,500/256	\$89.95	None	35,000	Shaped	Install fee \$89	2	Yes
TPG Internet	1.5Mb Value Unlimited	1,500/256	\$49.95	None	20,000	Shaped	Install fee \$129	6	Yes
Tropical North	ADSL-RES-1500	1,500/256	\$99	None	52,000	Shaped	Install fee \$109	12	Yes
Vintek	1500k Copper	1,500/256	\$89.95	None	16,000	Shaped	Install fee \$129	6	Yes



TALKING

VoIP

TALK TO THE LEADERS

VoIP is the communications technology that can save you real money. It allows you to make low-cost broadband calls from your own phone. And makes POTS (Plain Old Telephone Systems) a technological anachronism.

In 2005, NetComm is poised to launch a raft of new products from dedicated VoIP phones to technology that lets you make VoIP calls from a standard telephone handset.

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NetComm will help you enjoy benefits such as:

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- ① Untimed local calls from as little as 10c
- ① Mega savings on national and international calls
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- ① Simple set-up
- ① STD call caps
- ① Live information portals

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than doubles for others), and you're locked into a 12-month contract with no Rapid Transfer support.

Other good sub-\$30 broadband deals for those also prepared to lock into a phone plan are being offered by APT, Ecomtel and OptusNet. The latter's Cable Basic plan is a cheap way to discover the joys of cable download speeds, but with a 200MB download limit, you may soon regret not choosing one of Optus' higher-end plans. Still, at least Optus offers shaping rather than excess fees, so you won't be caught out with any hefty bills.

However, the best-value sub-\$30 deal we found was offered by the respected provider, Internode. Its HOME-256-Start plan offers a 256/64Kbps connection and 500MB download limit with shaping. Rapid Transfer support and a reasonable six-month contract.

If you need a bigger download limit, you'll have to spend around \$39 per month. Here, Netspace's 256 (M) plan offers great value, with a 5GB download limit (with an extra 5GB of off-peak downloads) and the backing of one of Australia's oldest ISPs. Not far behind are BIT.net's 256 Freedom Standard and Spin's 256C plans with download limits of 6GB and 3GB, respectively. All of these plans include shaping. Rapid Transfer support and reasonable contract terms.

Best midrange deals

For under \$50, you can find some pretty good 256/64Kbps plans that offer more downloads than Netspace's 256 (M), but if you're going to be downloading more than 5GB per month, it's time to consider a faster 512/128Kbps plan.

The best-value entry-level 512/128Kbps plan we found was BIT.net's 512 Freedom Standard plan at \$44.95 per month for a 6GB download limit with shaping. However, for just \$5 per month more, Aztec ISP's 512/128 plan and Curl Internet's 512/128Kbps plan both offer a massive 25GB download limit with shaping. All of these impressive plans feature Rapid

Transfer support and reasonable contract terms.

If you're looking for a better-known provider, Netspace's 512 (M) plan offers a 5GB peak download limit and shaping for \$49.95 per month. For those willing to lock into a phone plan, iPrimus' Total 512-12000 plan has a 12GB download limit and shaping for just \$50 per month, but that jumps to \$69.95 without the phone bundle and again, there's a lengthy 12-month contract and no Rapid Transfer support.

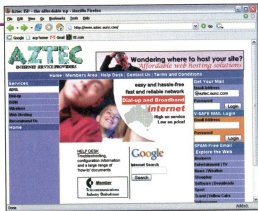
Best high-speed deals

For \$60, you'll find 512/128Kbps plans with 10GB-plus download limits from a number of good providers, including Internode and BigPond. However, these upper-end 512/128Kbps plans are starting to come under pressure from a couple of providers with new aggressively priced high-speed plans.

Leading the way is iiNet, whose new Broadband2 plans now offer 1,500/256Kbps ADSL connections as a minimum, or an incredible 8,000/1,000Kbps connection if you live near an iiNet-enabled exchange. At the entry level, iiNet's Starter plan has a 2GB download limit (and another 2GB off-peak) for \$39.95 per month, while its Light plan has a 10GB limit (plus 10GB off-peak) for \$49.95. Its Medium plan offers 20GB (plus 20GB off-peak) for \$69.95, and Heavy offers 40GB (plus 40GB off-peak) for \$89.95. The catch is you have to sign up to iiNet's phone service to get these prices and the 8,000/1,000Kbps connection speed, but there's no pay to play only \$10 more per month for a 1,500/256Kbps connection, which is still comparatively good value. The plans all offer shaping and Rapid Transfer support.

TPG is following a similar strategy, ditching its lower-speed plans and (with one 512/128Kbps exception), is offering only 1,500/256Kbps connections. However, its pricing is as keen as ever, with its 1.5Mb Value Unlimited plan offering a big 20GB download limit and shaping for just \$49.95 per month. That's simply

For just \$49.95 per month, both Aztec ISP and Curl Internet offer 512/128 plans with a massive 25GB download limit and shaping.



amazing value, and although user feedback on Whirlpool about the service is mixed, TPG supports Rapid Transfer and a reasonable minimum term of six months.

Above this, there's plenty of good value from other providers, with Aztec ISP. Come On Aussie and Schaelec Internet all offering a 1,500/256Kbps plan with a whopping 35GB download limit and shaping for under \$90.

Even larger providers like Internode, Netspace and OzEmail offer 1,500/256Kbps plans with 12GB-plus downloads and shaping for under \$100. Even better value, if it's available to you, is BigPond's Unlimited Cable plan, with its 10GB limit and shaping for \$59.95. If you're willing to lock into Optus' phone service, its cable plans are also good value: \$69.95 for a 12GB limit or \$99.95 for 20GB, each with shaping. The catch for all these cable plans is that they require a minimum 12-month commitment, there's no Rapid Transfer support and you can't use the cable modem with any other service.

Finally, at the top end, you can find 50GB and unlimited download 1,500/256Kbps plans ranging from \$120 to \$200, but frankly, you'll need to be a very dedicated downloader to justify these prices with so many good sub-\$100 deals on offer.

The bundle conundrum

As we've just seen, there are significant discounts for some broadband plans if you take additional services from the

same telecommunications company. The most common services are discounted long-distance calls, which usually includes calls to international and mobile numbers as well. Some providers also offer discounts on local calls and line rental, and a handful sell discounted pay TV packages as well.

The most common tactic is a simple pricing discount, but some offer bonus services, such as free SMSes or local calls, rather than direct price discounts.

In the tables accompanying this feature, we've listed broadband plans at their discounted price and noted the extra charges that apply to customers who don't access those other services. Those companies that do pursue this kind of pricing model generally aren't worth considering if you don't want to take on the extra services, as the additional fee makes the service more expensive than similar rivals.

One argument that is often mounted for this kind of approach is convenience: rather than having to deal with multiple providers, you receive a single bill at the end of each month, and customer service can also be handled by a single company.

If the convenience argument is important to you, then it's worth checking whether it will actually happen in reality. For instance, Telstra has only recently gained the ability to include broadband services on its main customer phone

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☛ bills, and that service is only being slowly rolled out across the country. So, it could well be 2006 before you finally get a single bill from them.

The customer service angle is also important here. With larger telecommunications companies, you are likely to be diverted between multiple departments if you ring with a service inquiry, even if there's a single number advertised for contact. In general, smaller providers are better at providing single bills and unified customer service.

In the end, choosing whether to bundle depends on how badly you want a particular broadband deal, and whether the phone deal on offer matches your phone usage patterns.

☛ Which phone plan?

So, how good are the phone services offered by these ISPs-turned-telcos? The simple answer is that there are some very good deals out there. The hard part is choosing the right one, because there are just so many variables in the plans and in customers' usage patterns.

In particular, the two major telcos, Telstra and Optus, offer a somewhat confusing array of plans. That's not to say they don't offer some reasonable deals. For example, Optus has an option for local calls at 15 cents per call.

Of the smaller providers with conventional phone services, Ecomtel's plans look impressive, with one deal offering 15.5-cent local calls and national calls for 9.5 cents per minute capped to \$2.25 (or less off-peak) for up to three hours. The downside: Ecomtel's broadband plans are reasonable, but not among the best value available.

Of those providers with good bundled broadband deals, AAPT offers a good conventional phone plan, with 17.5-cent local calls and 18 cents per minute for national calls (with a \$1.98 maximum for up to two hours). iiNet is pretty good, too: 18-cent local calls and 15 cents per minute for national calls (\$2.50 maximum for one hour).

Primus' plan is somewhat

HOME VOIP PLANS COMPARED

Company	Plan	Monthly charge	Call charges	Hardware	Web site
Broadband Phone	BSP Plug'n'Play	\$15.95	Local, \$0.15 (with 50 free each month); national, \$0.10/minute; mobile, \$0.30/minute; international \$0.05 to \$4	IP phone \$259	www.broadbandphone.com.au
engin	\$19.95 Plan	\$19.95	Local, \$0.10; defined cities, \$0.10; national, \$0.10/minute; mobile, \$0.30/minute; includes \$10 credit for mobile/international calls	Voice Box converter \$149	www.engin.com.au
engin	engin \$29.95	\$29.95	Local, \$0.10; defined cities, \$0.10; national, \$0.10/minute; mobile, \$0.30/minute; includes \$20 credit for national/mobile/international calls or 200 local calls	Voice Box converter \$149	www.engin.com.au
FaktorTel	Standard	\$12	National, \$0.07/minute; mobile, \$0.29/minute; international, \$0.07 to \$4/minute	Telephone adaptor \$154	www.faktortel.com.au
FaktorTel	Premium	\$12	Defined capital cities, \$0.10/minute (capped at \$0.96); national, \$0.13/minute; mobile, \$0.30/minute; international, \$0.07 to \$4/minute; guaranteed Australian routing	Telephone adaptor \$154	www.faktortel.com.au
FreshTel	Firefly	None (no standard number)	National, \$0.07/minute; mobile, \$0.30/minute; international, \$0.07 to \$5/minute	USB IP phone \$129	www.freshtel.net
Nella	SmartVoice Basic	\$9.90	Local \$0.15; defined capital cities \$0.15/10 minutes; defined provincial cities \$0.20/10 minutes; other national \$0.05/minute; mobiles \$0.30/minute; international \$0.05-\$2.62/minute depending on destination	IP phone \$99.95; USB analog adaptor \$89.95	www.nella.net.au
Nella	SmartVoice Plus	\$19.95	Local, \$0.10; other national, \$0.01/minute; mobile, \$0.22/minute; international, \$0.01 to \$2.62/minute	IP phone \$99.95; USB analog adaptor \$89.95	www.nella.net.au
Simtex	Casual User	None	Local, \$0.16; national, \$0.13; mobile, \$0.37; international, \$0.04 to \$15/minute	Not disclosed	www.simtex.com.au
Swiftel	SwiftvoiceIP	\$5.50	Local, \$0.15; national, \$0.12/minute; mobile, \$0.30/minute; international, \$0.09 to \$10.58/minute	IP phone free, but requires 12-month contract	www.swiftel.com.au

CONVENTIONAL PHONE SERVICES COMPARED

Provider	Monthly charge	Call charges	Web site
AAPT Smartchat	\$29.95	Local, 17.5 cents; national, 18 cents per minute (\$1.98 max for up to two hours); mobile, 33 cents per minute (\$2.50 max for up to 20 minutes). Package deals available.	www.aapt.com.au
DigiPlus	\$23.50	Local, 20 cents; national under 50km, 8.8 cents per minute; national capital, 19.8 cents; national regional, 22 cents; mobile, 33 cents; plus 35 cents flagfall for national/mobile calls. Off-peak rates and package deals available.	www.digisurf.net.au
Ecomtel	\$29.35	Local, 15.5 cents; national, 9.5 cents per minute capped to \$2.25 for up to three hours; mobile, 29 cents per minute, plus 20 cents flagfall for national/mobile calls.	www.ecomtel.com.au
iiNet	\$29.95	Local, 18 cents; national, 50 cents per three minutes or \$2.50 for one hour and 15 cents per minute thereafter; mobile, 33 cents per minute, plus 20 cents flagfall.	www.iinet.net.au
Primus	\$59	Free local calls (fair use conditions apply); national, 20 cents per minute (plus 35 cents flagfall) capped to \$2.50 for up to two hours; mobile, 33 cents per minute (plus 35 cents flagfall). Includes dialup internet account.	www.primustel.com.au
Optus	\$29.95 or \$33.95 (depending on plan)	Local, 15 to 22 cents (depending on plan and network); standard national, 16 cents per minute; standard mobile, 37 cents per minute (capped to \$2 for up to 20 minutes), plus 37 cents flagfall for national/mobile calls; off-peak rates and package deals with capped charges available.	www.optus.com.au
Telstra	\$18.50 to \$29.95 (depending on plan)	Local, 17.5 to 30 cents (depending on plan); standard national from 4 cents to 23 cents per minute (depending on distance), plus 35 cents flagfall; standard mobile, 33 cents (Telstra) or 37 cents (non-Telstra), plus 35 cents flagfall; off-peak rates and package deals with capped charges available.	www.telstra.com.au

different. There's a fixed monthly charge of \$59, which doubles the usual cost of line rental, but all local calls are free. It sounds intriguing, but do the maths first: you'll need to make at least 150 local calls per month to make this deal worthwhile. It's also subject to a fair usage

policy, which means Primus can kick you off the service if you make an unreasonably large number of calls.

If you make overseas calls, you'll need to compare rates to your regular call destinations. For calls to mobiles, most standard rates are around 30

cents per minute, so for many, it will pay to shop around for deals such as Optus' \$2 capped rate for calls to mobiles of up to 20 minutes.

Apart from Primus, the cost of line rental is usually much the same for standard plans—just under \$30 per month. You



can find lower line rental, but generally at the expense of higher call charges, so these plans are only suitable for low-use customers.

We've only just scratched the surface of phone plans here. You need to assess your typical phone usage patterns and then look at all the plans offered by the providers.

Many providers offer cheap rates at particular times of day, which can be handy if you have regular calling patterns, but a nuisance otherwise. As with broadband, contract length is also a consideration. Telecommunications companies will often try to lock you into long-term deals, but that will inevitably limit your flexibility. Also check carefully what the payment options are; some providers charge a higher fee if you use a credit card, or they insist on using direct debit.

VoIP plans

Alternatively, you could try one of the new VoIP services. The concept of using a high-speed Internet connection to make phone calls is not a new one. Large corporations, which typically have their own networks running throughout buildings and often between different locations, have turned to VoIP solutions in increasing numbers because they minimise both call costs and network maintenance expenses.

With the increasing use of broadband by home users, VoIP has also become a realistic possibility for home users. There are numerous software packages (softphones) available,

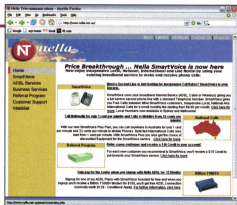
which allow PC users armed with a headset to make calls to other users with the same software for nothing, and in some cases, to normal phone lines for an additional fee (see Rose Vines's tutorial on page 77). However, using a headset connected to a PC doesn't match the convenience of a normal home telephone.

To overcome this problem, an increasing number of providers are now offering home VoIP solutions that allow you to either plug a special handset into your broadband modem, or hook it up to your existing home telephone. You sign up with a provider for a monthly fee, and are able to make and receive calls on that phone like a conventional handset. The difference is that your calls are routed over your broadband Internet connection, and the rates charged are quite different — and usually lower — than what you are likely to pay with your existing telephone company.

The savings can be quite significant. Most VoIP plans offer rates of around 10 cents per local call and 10 cents per minute for national calls — around the half the price of many standard phone plans. But even more competitive are the international rates: calls to popular locations such as the US or Europe are available for under 5 cents a minute. Yes, they're lower than national calls, thanks to the Internet and overseas competition.

Unfortunately, there's often not much difference in calls to

Nella's SmartVoice Plus is a ripper of a VoIP plan, with 10-cent local calls, national calls for just 1 cent per minute, and international calls from 1 cent per minute.



mobiles: they're still generally around 30 cents per minute. However, the monthly charge is lower than conventional services — around the \$10 to \$20 mark, and sometimes including free calls.

What's more, most of the plans are contract-free, so you can sign up and quit whenever you like. However, if you're prepared to sign up for 12 months (with an early disconnection fee of \$99.95), you can get a ripper of a deal from Nella. Its SmartVoice Plus plan offers 10-cent local calls, national calls for just 1 cent per minute, mobile calls at 22 cents per minute and international calls from 1 cent per minute, with a monthly fee of \$19.95. Potentially, it could wipe hundreds off the phone bills of many typical Australian homes.

VoIP gotchas

While VoIP offers the potential for cheaper calls, there are several caveats. The most important is this: to take advantage of a VoIP service, you already need to have an existing broadband Internet connection. If you make lots of calls, your data usage could rise dramatically, which in turn could make your monthly broadband bill much higher and reduce any apparent cost savings. Therefore, we strongly recommend that you have a broadband plan with a high download limit and shaping before considering the move to VoIP.

Some VoIP users report patchy call quality, with echoes and delays during times of high

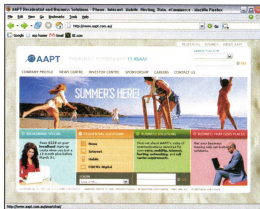
network use. It certainly isn't advisable to try to make a VoIP call while carrying out other data-intensive activities online.

Not all VoIP providers are available Australia-wide, and their definition of a local call can vary widely. As with any telephone plan, the best way to ensure you get a good-value deal is to have a solid understanding of your existing calling patterns, and find a plan that offers the best deal on the options you use most.

Also be aware that if your Internet connection goes down, so does your VoIP phone. If you decide to go all the way with VoIP and ditch your landline phone entirely, you'll need some form of backup for emergencies, like a mobile phone. ☹

THE VERDICT

Are you better off going for a bundle of services from the one provider, or broadband and phone plans from different providers? There's no doubt you can get good bundled deals, and it's the only way to get decent pricing from a major telco. But there are still plenty of good deals that don't require you to lock into an additional service. In particular, if you want to try one of the great-value VoIP services, such as Nella's SmartVoice Plus, then you're better off with one of the good standalone broadband plans. These include Internode's HOME-256-Starter, Netspace's 256 (M), Aztec ISP or Curl Internet 512/128Kbps plans, or TPG's 1.5Mb Value Unlimited.



AAPT Smartchat offers attractive bundles of broadband and phone deals.



BROADBAND & VoIP SUPERGUIDE

NATIONAL BROADBAND PROVIDERS

AAPT Smartchat: www.aapt.com.au
 Aardvark Internet: www.aardvark.net.au
 Accsoft Computer Technology: www.onmyweb.net
 Acenet Internet Services: www.acenet.net.au
 ACT Online: www.actionline.com.au
 ADSLdirect: www.adslirect.com.au
 AngelNET: www.angelnet.com.au
 AskAussie: www.askaussie.com
 AU1NET: www.au1.net
 AussieWide Internet: www.aussiewide.com
 AusWide Internet Services: www.auswide.net.au
 Aztec ISP: www.aztec.aunz.com
 bigblue Internet: www.bigblue.net.au
 Big Button Internet: www.bigbutton.com.au
 BigPond: www.bigpond.com
 BIT.net: www.bit.net.au
 BKB Internet: www.bkb.net.au
 Blue Net: www.blue.net.au
 Brown Bear Internet: www.brownbear.com.au
 CM Internet: www.cmi.net.au
 Come On Aussie Internet Services: www.comeonaussie.net
 ComputerXperts: www.cxi.com.au
 Connexus: www.connexus.com.au
 Curl Internet Solutions: www.curl.com.au
 Cyberspace Internet: www.cyberspace.net.au
 D2 Internet Services: www.d2.net.au
 DCSI: www.dcsi.net.au
 Diggy: www.diggy.com.au
 DigiPlus: www.digisurf.net.au
 Dinkum Internet: www.dinkum.net.au
 Dodo Internet: www.dodo.com.au
 E-Access: www.e-access.com.au
 e-partments: www.e-partments.com.au
 E-SOUL: www.esoul.net.com.au
 E.Tel: www.e-tel.com.au
 Ecomtel: www.ecomtel.com.au
 EFTel: www.w3.eftel.com
 Empcom: www.empcom.net
 Encomm Internet: www.encomm.com.au
 Escape Online: www.escape.net.au
 Everlast Internet: www.everlast.net.au
 extremeDSL: www.extremedsl.com.au
 EZ ADSL: www.ezadsl.com.au
 ezConnect: www.ezconnect.com.au
 Froggy: www.froggy.com.au
 FunnelWeb Internet: www.fwi.net.au
 Futureweb: www.futureweb.com.au
 Gday.net: www.gday.net
 GeckoNet: www.geckonet.com.au
 Goldlink Internet Services: www.goldlink.com.au
 Goldweb Internet: www.goldweb.com.au
 G0talk: www.gotalk.com.au
 Goulburn Internet: www.goulburn.net.au
 Graytech Hosting: www.graytech.net.au

WHAT CAN'T YOU DO?

A common restriction on many residential ADSL deals is that they can't be used for hosting and connecting a Web or mail server. However, if you want to run a small site for your business, there are plenty of ISPs who will let you do so on a residential plan.

Wireless broadband plans

While setting up a home wireless network that links an existing broadband connection to other PCs is now a fairly commonplace activity, the technology for actually achieving a direct wireless broadband connection is still in its relative infancy. All of the currently available alternatives use some form of radio frequency to achieve high-speed transmissions. Of the three we examine below, Unwired and iBurst both use a specially dedicated spectrum, while NetConnect utilises the 3G telephony network created

by Hutchison.

Wireless broadband is particularly appealing for notebook users who travel frequently, but to date there's no dominant technology or obvious standout choice. Unlike conventional mobile phones, none of the alternatives reviewed below have truly national coverage, and this lack of widespread availability is likely to keep prices high for some time. Wireless services also suffer from more performance variations than wired alternatives; ideally, you need to check if the service works in your home or office before committing to it.

Unwired

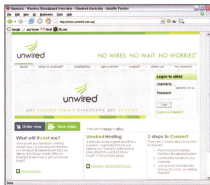
Unwired's proprietary wireless technology is currently only available in Sydney, but the company has national expansion plans. The distinctive-looking modem, which can run at any of three speeds (256/64Kbps, 512/128Kbps and 1,024/256Kbps), is easy to install and plugs directly into your network port. Less impressive is the built-in Web mail interface, which is one of the clunkiest designs we've ever seen—we'd recommend you stick with using another account and a separate client.

Since PC User last tested this product, access speeds appear to have dropped a little (we

tested the 1,024/256 option this time), but it still remains adequate for most purposes. You can move the modem between different locations, but it needs to be plugged in to power, which restricts its flexibility somewhat and means it runs fairly hot.

Unwired has an effective monopoly on supplying its modem, which at \$189 is double the price of an ADSL equivalent. However, for users who can't receive ADSL in their area, this is unlikely to be a concern. Overall pricing is very similar to existing broadband options, including plans where speeds are shaped after you exceed download limits.

Price: modem, \$189; monthly contracts from \$34.95
Contact: Unwired Phone: 1300 761 881 Web: www.unwired.com.au
 + Works in some ADSL-free areas
 + Easy to install
 - Only available in Sydney





3 NetConnect

Hutchison's 3 network remains the only 3G mobile network currently in operation in Australia. The higher speeds of 3G make it a natural for data, and while you can browse email and the Web from a 3G phone, being able to connect to the network from a laptop is still more flexible. The NetConnect card, which contains a 3 SIM card, plugs directly into your notebook's PC Card slot, so there's no need for a separate

power source. Another handy feature is the ability to send SMSes directly from your notebook.

While the speed offered by 3 can be expensive, we found that it quite often dropped back to less impressive GPRS (mobile) speeds in practice. The connection software also seems a little flaky in the current release, but if you're likely to be using a 3G phone anyway, this is certainly an option to consider.

NATIONAL BROADBAND PROVIDERS

HC Internet: www.hcinternet.com.au
 Highstream Communications: www.highstream.com.au
 Hi Speed: www.hispedit.com.au
 Hotkey Internet: www.hotkey.net.au
 Hylinx: www.hylinx.com
 Hypermax: www.hypermax.net.au
 HyperOz: www.hyperoz.com.au
 i-Blue Internet Services: www.iblue.com.au
 iNet: www.inet.net.au
 Independent Service Providers: www.isp.net.au
 Instant Communications: www.in.com.au
 Internode: www.internode.on.net
 Interwerks: www.interwerks.net.au
 IPrimus: www.iprimus.com.au
 ISX: www.isx.com.au
 iXpress: www.ixpress.com.au
 Mightynet: www.mightynet.com.au
 Nella Telecommunications: www.nella.net.au
 Net2u: www.net2u.com.au
 Netbay Internet: www.netbay.com.au
 NetCentral: www.netcentral.com.au
 NetExpress: www.netexpress.com.au
 Netspace: www.netspace.net.au
 OptusNet: www.optusnet.com.au
 OTSS Internet: www.otss.com.au
 OzADSL Net Unlimited Internet: www.ozadsl.com.au
 OzEmail: www.ozemail.com.au
 Ozziehost Internet Solutions: www.ozziehost.net.au
 OzzieNet: www.ozzienet.net
 OzzieWeb CheetaH ADSL: www.ozzieweb.net.au
 Pacific Internet: www.pacific.net.au
 Planet Netcom: www.pnc.com.au
 Platform Networks: www.platformnetworks.net
 Primus-AOL: www.primusonline.com.au
 QConnect Internet Services: www.qconnect.net.au
 Rascal Internet: www.rascal.com.au
 Schaelec Internet: www.schaelec.com.au
 Shoalnet Fastrac Internet Services: www.shoal.net.au
 Sirion Broadband Internet: www.sirion.net.au
 Spiderweb: www.spiderweb.com.au
 Spin: www.spin.net.au
 SurfNet City: www.surfnetcity.com.au
 TeeGee Internet: www.teegee.com.au
 Total Internet Solutions Group: www.tisgroup.com.au
 TopSpeed Internet: www.topspeed.com.au
 TPG Internet: www.tpg.com.au
 Tropical North Internet: www.tropicalnorth.com.au
 Veridas Telecom & Internet: www.vti.com.au
 Veritel: www.veritel.com.au
 Vintek: www.vintek.net
 Web Ace: www.webace.com.au
 Wild Internet: www.wildsl.com.au
 Wizardtechs: www.wizardtechs.net

6 Price: Plans range from \$29 to \$99/month Contact: 13 16 83 Web: <http://business.three.com.au> + Relatively widespread coverage - Service can drop back to GPRS speeds - Expensive



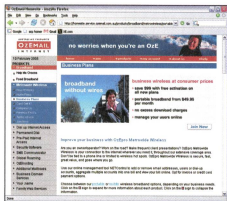
OzEmail Metrowide Wireless

OzEmail is one of several companies reselling the iBurst wireless service, which is currently available in Sydney, Melbourne and the Gold Coast. Like Unwired, it is available in 256/64Kbps, 512/128Kbps and 1,024/256Kbps speeds; unlike Unwired, you can choose between a powered home modem or a PC Card version (we tested the latter).

Installation of the PC card modem is straightforward, and it uses the standard Windows network connection software.

Much of iBurst's marketing promotes the fact that it can be used anywhere, but this claim needs to be taken with a grain

of salt, as signal availability varies widely. In an area marked on iBurst's coverage map as having a strong signal, we were only able to access the service by visiting a nearby lookout. When the service does work, it offers good performance, but you wouldn't want to purchase it without testing the signal first. ☹



7 Price: \$99 activation fee; modem, \$125; plans from \$49.95/month Contact: 13 35 93 Web: www.ozemail.com.au + Straightforward card technology and installation + Reasonable coverage area - Coverage variable within service areas - Unfriendly error messages



All-in-one network devices

Getting broadband or want to share your connection? Nathan Taylor reviews 11 new network devices.

In the old days, you had to buy a separate device for every network task. Now, you can find a network

device to suit any home or small office need. Even the most basic router has an integrated switch and firewall, allowing you to share your Net connection, network at least four PCs using standard Ethernet cables, and protect those PCs from hackers. However, there are also routers with an integrated ADSL modem or wireless access point, or additional ports for directly

connecting printers, cameras and storage devices. And you can find a router with just about any combination of these features, so it's simply a matter of trying to match your needs. Even if you're getting your first ADSL connection, we'd advise you to consider an ADSL router, rather than just an ADSL modem. ADSL routers generally cost only a little more, but you'll

be able to share your connection without having to purchase yet another device to do so. If you're new to networking, we recommend you read this month's Enterprise feature on page 70, where we've provided a guide to networking basics. The principles of buying gear for a small network are much the same for the home and office.

ADSL ROUTERS

ZyXEL Prestige 660H

Looking for a standard ADSL router to connect to and share your Net connection without having to buy an ADSL modem? The ZyXEL 660H would be our first choice. It's an outstanding product, with an excellent management interface, tons of features, great security and some very useful traffic shaping capabilities. It's also ADSL2+ compliant, so when the new services come online, you'll be ready for them without needing a hardware upgrade.

We were particularly jazzed

by its traffic shaping capabilities. These really set the router apart from others in this price range. You can both prioritise traffic and set speed limits on some kinds of services. You could determine, for instance, that Web transfers are never to occupy more than 4Kbps of Internet bandwidth. Setting up bandwidth limiting is a little strange, but once it's going, it is fantastic, especially if you find that one or two services (especially peer to peer) are clogging up your network or

giving you massive volume bills at the end of the month.

The stateful firewall is also of the highest quality, with settings, upstream and downstream configurability, and rule controls that rival the best software firewall packages.

Then there's keyword and time-based content filtering,

DDNS support, excellent remote management capabilities (including remote telnet management), email notifications to the administrator and a management interface that ties it all together very well.

This is our pick of the wired ADSL routers we tested.



Price: \$119 Contact: Bluechip Infotech Phone: 1800 803 802
Web: www.zyxel.com + Great traffic shaping
+ Excellent security - Setup can be a little strange

NetComm NB5

Much like the ZyXEL above, the NetComm NB5 has a lot going for it. It's an ADSL2 modem (with ADSL2+ available after a firmware upgrade), and it has a lot of advanced features and an excellent administration interface. NetComm has obviously done a lot of work on its management interface. Compared to the popular

NB1300, the management of the NB5 is remarkably clean and quick. Setup options are neatly laid out, with the ability to drill down into fine details when necessary.

It should be noted that some of the setup methods are a little

unusual, especially for the firewall. Most routers work on IP addresses and application port numbers. With the NetComm, you set up rules and names. For someone who is familiar with setting up routers, it's a little off-putting, but we

can see how it could be very useful for managing small networks. For instance, you create a user called Joe, who lives at a given IP address. You then drag and drop access rules (from the predefined set, or self-made) for that user. However,

Price: \$139 Contact: NetComm
Phone: (02) 9424 2000 Web: www.netcomm.com.au + Quality interface + Good security - Unusual firewall setup





the rules aren't that detailed, and the firewall lacks the power of the ZyXEL. On the upside, the NetComm supports a collection of preset port forwarding rules, which means that configuring the firewall for your favourite games and applications is easy

— you don't even need to know what port they run on. It even supports common peer-to-peer applications.

The NetComm also supports Quality of Service (QoS), but this is limited to some rather complicated weighting rules.

It lacks the ability of the ZyXEL to set absolute limits on certain services; it only prioritises messages.

With its USB interface in addition to Ethernet, this is a very impressive router for the price. It lacks an integrated

switch, but it has features to make up for it, including some that are almost unique to routers in this category, such as support for multicast, MAC filters and SNMP (simple network management protocol).

Billion BIPAC 5100

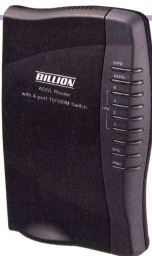
It's obvious that the same people who make the firmware for the Billion modems make the firmware for the ZyXEL modems, as the interfaces are identical. Which, in both cases, is a good thing, since the interface is excellent. Setting up the router manually or using a wizard is very quick — we had it up and running on our Internet connection in less than three minutes. The presets are pretty good for a small network, so the

router is almost plug and play.

The port forwarding interface of the Billion is a little unusual, with support for ranges of ports, rather than individual port numbers. This is very cool if you want to use services (like IRC) that use a range of addresses. It also makes it very simple to set up multiple DMZ hosts.

The 5100 is a no-frills ADSL modem. Unlike the ZyXEL 660H, it is not ADSL2 compliant,

7.5 Price: \$109 Contact: PC Range Phone: (08) 8322 9544 Web: www.billion.com.au + Low cost + Great interface - Weak on features



does not have bandwidth management or a stateful firewall, and does not support added features like email alerts to administrators. What it does have is a four-port integrated switch, support for DDNS, and a very low sticker price. For many small networks, this is all you'll need to get up and going.

WIRELESS ADSL ROUTERS

ZyXEL Prestige 660HW

9 Price: \$179 Contact: Bluechip Infotech Phone: 1800 803 802 Web: www.zyxel.com + Excellent feature set + Bandwidth/QoS controls are great - No VPN support



Want to share your Net connection wirelessly and save on the cost of an ADSL modem? A wireless ADSL router is the answer and once again, ZyXEL have come up trumps. The 660HW is a very impressive product. It is at once powerful, configurable and easy to use. It has a stack of features (really only lacking VPN capabilities), great reporting capabilities and DSL2+ compliance, which is a plus, given the emergence of 2 services this year. ZyXEL is nicely

preconfigured for turnkey installation, with one exception: the default wireless security setting will leave your network wide open (this, incidentally, is true of most of the wireless devices we have looked at).

Its Web-based management interface is excellent. It's clean, easy to navigate, holds very good logs (which can be configured to be emailed to an administrator when needed) and covers off everything you could look to configure.

ADSL ROUTERS COMPARED

	Billion BIPAC 5100	NetComm NBS	ZyXEL Prestige 660H
ADSL compliance	ADSL1	ADSL1, ADSL2	ADSL1, ADSL2+
Firewall	Stateless (NAT) with integrated filter rules	Stateful	Stateful
Ethernet ports	Four Fast Ethernet	One Fast Ethernet (plus USB)	Four Fast Ethernet
Physical DMZ port	No	No	No
VPN	No	No	No
Content filtering	None	None	Keyword, time and user based
QoS controls	No	Yes	Yes
DDNS support	Yes	Yes	Yes
Remote management	Yes	Yes	Yes

We were particularly impressed by its highly configurable firewall rules, which can be used to block ingoing and outgoing messages based on the type of application, source and destination, and time of day. It's not just port forwarding and blocking — it's a *real* firewall.

The QoS bandwidth management capabilities of the ZyXEL are also extremely impressive. Although painful and confusing to set up, it presents you with a huge

number of bandwidth management options. It's not just prioritisation of certain message types over others — it's actual bandwidth limiting as well, configured by application, network, source and destination. You can say, for instance, that port 4662 (eMule) messages are not allowed to upload at more than 2Kbps. If you're on a volume-charged Internet account, this could be a godsend. For this feature alone, we cannot recommend the ZyXEL highly enough.



BROADBAND & VoIP SUPERGUIDE

Billion myGuard 7500GL

There seems to be nothing that the Billion can't do, and many of the things it does, it does well. However, some features appear tacked on. The management interface is a bit ugly and a bit nonsensical (such as the separation of firewall management from port forwarding settings), but it's fast and generally functional.

The integrated stateful firewall is quite good. It's highly configurable, has some decent

preset security levels and generally does all that it needs to. Its VPN support is also quite good, covering all the major VPN protocols (IPSec, PPTP and L2TP) and should be compatible with most other VPNs. The router's wireless security covers the basics, but does not support user authentication by a third-party (RADIUS) server.

It also has an integrated Trend Micro virus software enforcement policy. It tests LAN

8 Price: \$249 Contact: PC Range Phone: (08) 8322 9544 Web: www.billion.com.au + Tons of features + Virus policy enforcement - Some features not well implemented

PCs for network vulnerabilities and making sure that they're running the latest version of the virus scanner.

The Billion has both traffic prioritisation and IP throttling. The former lets you configure what packets go through first if there's a queue; the latter lets you put bandwidth limits on certain kinds of services. However, throttling only works on the upstream and can only



be configured in 32Kbps increments.

All in all, this is a decent, inexpensive router. It's not really great at anything in particular, but it does do a lot of things.

TECH TERMS

ADSL2/ADSL2+. ADSL2 is new standard that is designed to extend the range and speed of ADSL lines. ADSL2+ effectively doubles the bandwidth of the line over short distances.

ADSL modem. A device that connects your PC to an ADSL broadband service.

ADSL router. A router with an integrated ADSL modem, allowing you to connect to and share an ADSL service.

Gateway. Another term for a router, used to distinguish multifunctional home routers from basic routers.

Router. A device that connects a network to another network (such as the Internet).

Switch. An intelligent hub, which connects a number of PCs together into a network, usually using Ethernet cable.

Wireless access point. A device that serves as a hub or gateway for a wireless network.

D-Link DSL-G604T

Much like the 3Com appliance below, the D-Link doesn't offer much in the way of thrills, but it offers a good, basic setup and configuration.

Where it does exceed the 3Com is in its firewall and port forwarding capabilities. You can set up some quite detailed firewall rules, including both inbound and outbound rules, as well as blocks for common attacks through its intrusion detection system. Its wireless security supports the latest standards, and includes support for third-party authentication of users trying to access the network. It lacks MAC address

filters, although this is not a huge problem, given that MAC addresses can be readily spoofed in any case.

The administration interface is quite basic, which is not surprising since there is not that much to configure. Even new users should be able to jump right in, using the online help as a guide.

Even though it lacks the considerable feature set of the Billion or ZyXEL routers, it's difficult to dislike the D-Link. It's straightforward, a breeze to get up and running, and does everything that most small businesses would want.

7 Price: \$189 Contact: D-Link Phone: (02) 8899 1800 Web: www.dlink.com.au + Simple + Good firewall - Lacks some features



3Com OfficeConnect ADSL Wireless 11g Firewall Router

6 Price: \$250 Contact: 3Com Phone: 1800 678 515 Web: www.3com.com + Simple to manage + Good wireless security - Lacking in features



It's hard to recommend this router over some of the less expensive but more feature-rich appliances we've looked at. What you get is what is an ADSL

router with a four-port switch and 802.11g wireless capabilities. Its security features are limited, it has no traffic shaping capabilities, no VPN

and only the most basic of content filtering applications.

The simplicity of the device makes it very easy to manage, and the quality engineering of 3Com ensures you have a reliable product. If you have no interest in all the whizz-bangery of products like the Billion or ZyXEL, this might be a good option.

Its Internet security options are limited, with downstream filtering of packets as well as port forwarding settings for servers

within the LAN. It has some additional options to prevent ping-based hacker attacks, but little else. Its wireless security options are more extensive, supporting both WEP and WPA. For the latter, it can use either a pre-shared key or rely on RADIUS authentication.

If a simple, reliable device, with a good help system and very good administration interface is all you're after, the 3Com may be the go. If you want some thing that does a little more, look elsewhere. **11**

Australia's No.1 Notebook & Media Centre PC* TOP PERFORMANCE & GREAT FEATURES

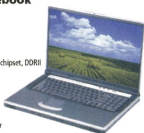
Pioneer POWER 47/87/900 Notebook

RRP from \$2999

- 47 Series: ATI 128M 9700
- 87 Series: ATI 256M 9700, IDE Raid
- 900 Series: Nvidia 256M 6800 PCIe upgradeable, Intel 915 chipset, DDRII

Media Centre, Digital TV

- Intel® Mobile Pentium® 4 Processor 3.0/3.2/3.4/3.6G
- 256M / 512M / 1G / 2G DDR 400M / DDRII RAM
- 40/60/80/100 GB HD, Cavi Reader
- 24X CD / 24X CD/RW/DVD Combo / 8x DVD +/- RW Dual layer
- 17" TFT WXGA / WSVGA Wide Screen
- 5.1 S/PDIF Digital Audio with 4 Speakers, 1 Subwoofer
- 1G LAN, 56K Modem, 1394 Firewire, Wireless LAN
- 2 USB2, PCMCIA, TV Out, Serial Port, Camera
- DreamVision Digital TV Tuner
- Microsoft® Windows XP Professional / Media Centre



BONUS
Creative
5.1 Speaker

Pioneer CentriNote 805 Notebook

RRP from \$1699

- Intel Centrino™ mobile technology
- Intel® Pentium® M Processor /1.6/1.7/2.0/2.1Ghz
- Intel PRO/Wireless Network Connection 802.11b/g
- 128M/256M/512M/1G DDR RAM
- 30/40/60/80/100 GB HD
- 24X CD / 24X CD/RW/DVD Combo / 8x DVD +/- RW Dual layer
- 15.4" Wide WXGA, UP TO 64M Intel VGA / 128M 9700 ATI
- 100/10M LAN, 56K Modem, 1394 Firewire
- 2 USB2, PCMCIA, TV Out
- 3D Digital Audio with 2 Speakers
- Microsoft® Windows XP Home / Professional



15.4" Wide Screen

Pioneer VALUE 300 notebook

RRP from \$999

- Intel® Celeron® Mobile Processor 1.6G
- 256M / 512M / 1G DDR 266/333 RAM
- 30/40/60/80 GB HD
- 24X CD / 24X CD/RW/DVD Combo / 8x DVD +/- RW DL
- 14.1" TFT XGA, UP TO 64M INTEL VGA
- 100/10M LAN, 56K Modem, 1394 Firewire
- 2 USB2, PCMCIA, TV Out, Camera, 3D Audio
- Microsoft® Windows XP Home / Ultimate/Windows



Pioneer SOHO 400 Notebook

RRP from \$1599

- Intel® Celeron® Processor 2.4/2.6/2.8Ghz or
- Intel® Mobile Pentium® 4 Processor 2.8/3.0/3.2Ghz
- 256M / 512M / 1G DDR 266/333 RAM
- 30/40/60/80 GB HD, 1.44M FDD in 1 card reader
- 24X CD / 24X CD/RW/DVD Combo / 8x DVD +/- RW DL
- 64M DDR SDRAM 128M ATI 9600
- 15" TFT LCD XGA/1024x768 / SXGA(1400x1050)
- 5.1 S/PDIF Digital Audio with 2 Speakers
- 100/10M LAN, 56K Modem, 1394 Firewire, Wireless LAN
- 3 USB2, PCMCIA, TV Out, Serial Port, Camera
- Microsoft® Windows XP Home / Professional
- Microsoft Office 2003 SEE



Pioneer CentriNote 120 Notebook

RRP from \$1699

12" Wide Screen

- Intel Centrino™ mobile technology
- Intel® Pentium® M Processor 1.6/1.7/2.0/2.1Ghz
- Intel PRO/Wireless Network Connection 802.11b/g
- 128M/256M/512M/1G DDR RAM
- 30/40/60/80 GB HD
- 24X CD / 24X CD/RW/DVD Combo / 8x DVD +/- RW DL
- 12" Wide XGA, UP TO 64M INTEL VGA
- 100/10M LAN, 56K Modem, 1394 Firewire
- 2 USB2, PCMCIA, TV Out, Camera
- 3D Digital Audio with 2 Speakers
- Microsoft® Windows XP Home / Professional



Pioneer SOHO 295/297 15"/17" LCD PC

RRP from \$1799

800MHz FSB

- Intel® Celeron® Processor 2.4/2.6/2.8Ghz or
- Intel® Pentium® 4 Processor 2.8/3.0/3.2Ghz
- 128M/256M/512M/1G DDR RAM
- 60/80/120/160/200 GB HD, 1.44M FDD
- 24X CD / 24X CD/RW/DVD Combo / DVD-RW VGL
- 15"/17" TFT Touch Screen XGA, UP TO 64M VGA
- AC/37 3D Audio, 4 USB2 and PCMCIA slot
- Keyboard and mouse
- Microsoft® Windows XP Home / Professional
- Microsoft Office 2003 SEE



Pioneer Dream PC

RRP from \$999

- Intel® Celeron® Processor 2.4/2.6/2.8Ghz or
- Intel® Pentium® 4 Processor 2.4/2.6/2.8Ghz
- 128M/256M/512M/1G DDR RAM
- 30/40/60/80 GB HD
- 24X CD / 24X CD/RW/DVD Combo / 8x DVD +/- RW
- Intel Extreme VGA, AC/37 Audio
- 2 Firewire, 4 USB 2, 100/10M LAN
- Intel 801 / 256M / 512M / 1G / 2G / 4G / 8G / 16G / 32G / 64G / 128G / 256G / 512G / 1024G / 2048G / 4096G / 8192G / 16384G / 32768G / 65536G / 131072G / 262144G / 524288G / 1048576G / 2097152G / 4194304G / 8388608G / 16777216G / 33554432G / 67108864G / 134217728G / 268435456G / 536870912G / 1073741824G / 2147483648G / 4294967296G / 8589934592G / 17179869184G / 34359738368G / 68719476736G / 137438953472G / 274877906944G / 549755813888G / 1099511627776G / 2199023255552G / 4398046511104G / 8796093022208G / 17592186044416G / 35184372088832G / 70368744177664G / 140737488355328G / 281474976710656G / 562949953421312G / 1125899906842624G / 2251799813685248G / 4503599627370496G / 9007199254740992G / 18014398509481984G / 36028797018963968G / 72057594037927936G / 144115188075855872G / 288230376151711744G / 576460752303423488G / 1152921504606846976G / 2305843009213693952G / 4611686018427387904G / 9223372036854775808G / 18446744073709551616G / 36893488147419103232G / 73786976294838206464G / 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BROADBAND & VoIP SUPERGUIDE

WIRELESS ADSL ROUTERS COMPARED

	3Com OfficeConnect ADSL Wireless 11g Firewall Router	Billion myGuard 7500GL	D-Link DSL-G604T	ZyXEL Prestige 660HW
ADSL compliance	ADSL1	ADSL1	ADSL1	DSL1, ADSL2+
Wireless compliance	802.11b/g	802.11b/g	802.11b/g	802.11b/g
Wireless security	WEP and WPA (pre-shared key and RADIUS)	WEP and WPA (pre-shared key only)	WEP and WPA (pre-shared key and RADIUS)	WEP and WPA (pre-shared key and RADIUS)
Ethernet ports	Four Fast Ethernet	Four Fast Ethernet	Four Fast Ethernet	Four Fast Ethernet
Physical DMZ port	No	No	No	No
VPN	No	Yes	No	No
Content filtering	URL blocking only	Keyword, time and user based	No	Keyword, time and user based
QoS controls	No	Yes	No	Yes
DDNS support	No	Yes	No	Yes
Remote management	Yes	Yes	Yes	Yes

WIRELESS GATEWAYS

➤ A relatively new category of products, wireless gateways are wireless routers with a bit extra: usually, file and print serving capabilities, and sometimes even support for Web cameras.

The distinguishing feature

of wireless gateways is a device port — usually USB — into which can be plugged external hard drives, flash drives, cameras and printers.

The fundamental principal is that wireless gateways, in addition to being routers with

wireless access points, are a kind of set-top or turnkey server as well.

The early implementations we have seen are interesting, although they still have a long way to go, especially as file servers. We have yet to see a

wireless gateway with an integrated ADSL modem — their WAN ports are all Ethernet, so you will also need to get an ADSL modem or router (preferably running in bridged mode) if you want ADSL access.

Diamond Digital R100 Wireless Gateway

The R100 is well-designed, with the only flaw being the use of a USB 1.1 port instead of USB 2.0.

It has a very logical approach to administration, with plenty of help information and a manual that tells you what all the settings mean.

The security settings are among the best we have seen. Its highly configurable stateful firewall, combined with WPA encryption support (including support for the powerful AES cipher), should provide about as good protection as you can get on a wireless network. The firewall is capable of upstream and downstream filtering, and

can have variable settings for the time of day. Remote logging is supported, along with remote administration.

The R100 also sports URL filtering based on keywords. We're not sure how useful this feature really is, given the huge number of permutations and the high risk of false positives.

It has a USB port, into which you can attach a single Webcam, USB flash drive or USB hard disk. Files stored on the hard disk or USB flash drive are accessible via FTP only, either remotely or from within the LAN. It doesn't support Windows file sharing (SMB/

CIFS) at all, so mapping the FTP server to a drive can be a challenge. For security, you can set up individual login accounts, or use a universal account.

The big problem with the R100's file sharing is that the port is only USB 1.1, so we don't

recommend storing big files.

The printer interface is very basic, and drivers for a given printer must be installed on local PCs using software supplied with the R100, or be manually set up using TCP/IP as the printer port.



Price: \$249 **Contact:**
Mitsubishi Electric Phone:
1300 651 808 Web: www.
mitsubishi-electric.com.au
+ Logical interface with plenty
of online help + Excellent
security settings
— Only uses USB 1.1

NetComm NB620W Super G Wireless Gateway

This is not a flashy router. It has a simple NAT-based firewall, not a huge number of security settings, no traffic shaping or QoS features, and few other frills. But its administration

interface is nice, and it does support some unusual content filtering, including blocking certain file types from being downloaded via the Web (although this will not stop

peer-to-peer applications from downloading them).

Its wireless functions are very good, with support for wireless security options including the AES cipher and

MAC address filtering.

The NetComm has two USB ports, into which you can plug storage devices (hard disks and flash drives), printers or Web cameras.



7.5

Price: \$299 Contact: NetComm
Phone: (02) 9424 2000 Web:
www.netcomm.com.au • USB
2.0 support • Very good device support
– Weak router functions

As with the other wireless gateways, file service is managed by FTP, rather than Windows file sharing. It's not tremendously convenient, but it does work well. The support for USB 2.0 provides considerable speed, so transfer rates are not going to be a problem.

The router automatically detects the connected printer, and the print server can be accessed only after setting up a printer driver on the PCs, using the IP address of the router as the port number.

The Webcam interface, much like that of the Diamond Digital, is very neat, and even supports motion detection from

specific models. An internal Web service means that the camera can be viewed at any time from a Web browser.

The very good USB support makes up for some of its weaknesses as a router. It is the only device that has two USB ports, and if you plan to use a lot of file storage, we'd recommend it over the Diamond Digital, but not the Netgear.



BELKIN WIRELESS PRE-N ROUTER

The new 802.11n wireless networking standard is not set to become a reality until some time next year, but Belkin has already released the Wireless Pre-N Router, based on the draft standard.

802.11n is expected to be the next evolution of wireless network technology, using a new modulation technique called MIMO (multiple inputs, multiple outputs) to efficiently use the available radio spectrum. The result is speedier networking and greater range. Even though the rated throughput is likely to be in the range of 108Mbps hardware manufacturers are looking at 20Mbps or more of actual throughput, as opposed to 5 or 10Mbps.

Given that it's the only product of its type on the market, if you want the greater speeds offered by the Pre-N router, you need a compatible card (Belkin currently sells Pre-N PC Cards for \$230).

The Pre-N router is backwards compatible with 802.11g and 802.11a. It is a router with one Ethernet WAN port, an integrated switch and four Fast Ethernet ports. It also has a stateful packet inspecting firewall and a very nice management interface.

It costs \$379, and the fact that the 802.11n standard may change wildly between now and when it's finally released means the Pre-N is really a product for the hard-core first adopters. It is fast (some tests have rated its actual speed at over 40Mbps), but the lack of a certified standard is worrying. Netgear and Linksys are also planning to release draft 802.11n products this year, and we can only hope they are compatible with each other. Until the standard is ratified, there's no way to be sure.

Netgear WGT634U 108Mbps Wireless Media Router

7.5

Price: \$229 Contact: Netgear Phone:
1800 502 061 Web: www.netgear.com.au
+ The best file-sharing capabilities
+ USB 2.0 – No camera or printer support

Of the products reviewed, the Netgear is the most specialised. It doesn't have too many features, but it is the strongest

when it comes to file sharing. The administration interface is very polished, but slow. It has excellent live help systems, and

good monitoring and alert tools.

The firewall setup is very limited, with the capacity to only set inbound port filtering rules, although the capacity to open ranges of ports (rather than individual ports) is nice. The Netgear only supports pre-shared keys for WPA security, a limitation that will not affect

home users and small businesses, but will be a limiting factor in larger organisations.

It lacks printer and Webcam support. The only thing you can plug into the USB port is storage, in the form of a USB hard disk or flash drive.

The file-sharing capabilities are the best because it supports both FTP and Windows file-sharing (SMB/CIFS) access. That means accessing storage attached to the device is just like accessing a file share on a Windows server, and the shares can be mapped to drive letters in Windows. There are no real security settings, so everything that is shared is available to everyone on the LAN.

It has a single USB 2.0 port, which means the performance of the storage will be excellent. In fact, if file serving is what you're most interested in, we'd recommend this over the other wireless gateways.

The Netgear is not a fantastic router, but its file-sharing support is excellent. ☺

WIRELESS GATEWAYS COMPARED

	Diamond Digital R100 Wireless Gateway	NetComm NB620W Super G Wireless Gateway	Netgear WGT634U 108Mbps Wireless Media Router
WAN interface	Ethernet	Ethernet	Ethernet
Wireless support	802.11a/g with Super G	802.11a/g with Super G	802.11a/g with Super G
Wireless security	WEP and WPA (pre-shared key and RADIUS)	WEP and WPA (pre-shared key and RADIUS)	WEP and WPA (pre-shared key only)
Firewall	Stateful	Stateful	Stateful
Ethernet ports	Four Fast Ethernet	Four Fast Ethernet	Four Fast Ethernet
Physical DMZ port	No	No	No
VPN	No	No	No
Content filtering	URL filtering only	URL filtering and file type filtering	URL filtering
QoS controls	No	No	No
DDNS support	Yes	Yes	Yes
Remote management	Yes	Yes	Yes
Printer support	Parallel interface	Via USB port	None
Media connectivity	One USB 1.1 port, supporting storage and Web cameras	Two USB 2.0 ports, supporting storage, printers and Web cameras	One USB 2.0 port supporting storage

GeForce 6600 GT hits AGP

Nvidia's budget runaway success finally hits AGP boards, but beware fanless performance cards, says Darren Yates.

The graphics card market has been sparked by the arrival of Nvidia's new GeForce 6000 series, with the 6800 GT in particular setting new performance records. This month's arrival of the excellent 6600 GT in AGP8X format not

only gives owners of older systems something to smile at, it now gives us a chance to see what this card can do on an AMD Athlon 64 3800+ system. Here's what we gleaned from this month's testing.

1. The Radeon 9550 didn't

impress back in our January 2005 upgrade roundup; these days, it's a dog of a card that really needs to be retired as soon as possible.

2. Nvidia's 'performance midrange' GeForce 6600 GT cards continue to outperform ATI's Radeon X700 Pros in all our testing, and at a lower price tag to boot.

3. Fanless graphics cards get mighty hot. As PCs encroach further into the lounge room, the push is on for fanless

graphics cards to keep noise down. However, from our testing, we cannot see how the heat generated by these cards can be good for the rest of the system, or the cards themselves.

In the small confines of a micro PC, we'd be concerned for the thermal safety of the other components, and looking for a system fan to keep the overall temperature in check.

Of course, this somewhat defeats the purpose of a fanless graphics card, though.

Gigabyte GV-N66T128D

At long last, card vendors are starting to release AGP versions of the excellent, value-for-money GeForce 6600 GT.

This Gigabyte model is fairly standard 6600 GT fare with its heatsink/fan combo unit. Combined with Gigabyte's own K8NS Ultra-939 motherboard and AMD's Athlon 64 3800+ CPU, though, it mopped the floor with DOOM 3, hitting 82.6 frames per second (fps) at 1,024 by 768-pixel resolution — the highest result we've seen from this GPU so far.

To give you an idea of how good that is, our January 2005 upgrade feature results showed ATI's Radeon X800 XT hitting 91.5fps and Nvidia's GeForce

6800 GT hitting 89.8fps.

The main point of difference with the 6600 GT is that it drops further behind at 1,280 by 1,024-pixel resolution compared with those two front-runners (hitting 60.6fps compared with 72.9fps and 73.6fps, respectively).

Nevertheless, given that most mainstream gamers try their luck at a typical 1,024 by 768-pixel resolution, the 6600 GT continues to show remarkably good value for money. The fact that this and other 6600 GT cards are offering this level of performance with just 128MB of onboard memory should have you asking the question: what's the point of paying for 256MB? As far as



Price: \$319 Contact: Rectron Phone: (03) 9561 6166 Web: www.gigabyte.com.tw + AGP8X format + Excellent performance + Good value for money

we're concerned, there's no advantage to this extra memory whatsoever.

Gigabyte provides a basic budget package, with CyberLink PowerDVD 5.0 the only real bundled software, apart from the Nvidia driver software CD.

The card itself includes the usual VGA, TV-out (S-Video) and DVI connectors and requires an IDE four-pin Molex power feed from your PC's power supply.

All up, there's nothing fancy here, just good old-fashioned rip-roaring value.

Leadtek WinFast A6600 GT TDH

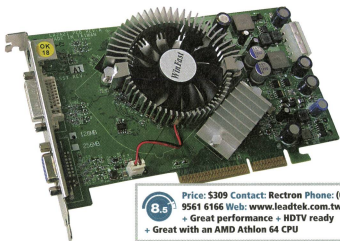
The second of our GeForce 6600 GT AGP8X cards came from Leadtek and again, it follows pretty much the Nvidia reference design. While it needs

an external four-pin Molex power connection, the onboard fan is one of the smallest we've seen in recent times. Leadtek claims the TV-out port is

actually HDTV-ready, although we'd prefer to use DVI or VGA to make the most of the onboard HDTV processing.

It comes with a good bundle

of software, including two old but full-version games (Prince of Persia and Splinter Cell) along with InterVideo WinDVD 5.0.



Price: \$309 **Contact:** Rectron Phone: (03) 9561 6166 **Web:** www.leadtek.com.tw
+ Great performance + HDTV ready
+ Great with an AMD Athlon 64 CPU

Gigabyte GV-RX70128D

The GV-RX70128D has a similar form factor to Gigabyte's X700 Pro version, but features the X700 GPU and only 128MB of memory. However, as we allude to the X700 Pro review below, the performance on the X700 on DOOM 3 suggests that ATI may have found a bit extra in new driver software under DirectX 9 games.

However, one cause of concern about this and the X700 Pro card is the use of a heatpipe/fanless heatsink mechanism. Although its aim is to reduce fan noise, the amount of heat rising off the heatsinks would be enough for us to think

about adding a system fan.

While we must give full credit to ATI and Gigabyte that neither card failed during testing, electronic components do not react well to heat. Without adequate system-wide cooling, the temperature inside your PC could rise significantly, stressing other components such as DVD burners and hard disk drives. It's a simple fact that electronic components running at speed produce heat, and you need to provide adequate ventilation to ensure those components (and others) don't blow up as a result of that heat. In addition, in the confined



Price: \$259 **Contact:** Rectron Phone: (03) 9561 6166 **Web:** www.gigabyte.com.tw
+ Better value than RX70P256V
- Slower than GeForce 6600 GT
- Fanless heatsink gets very hot

spaces of a micro PC, heat management is an especially important issue.

The X700 runs at a lower clock speed (400MHz versus 420MHz) compared with the Pro version, while the memory runs at 700MHz — 164MHz

slower than the X700 Pro.

All up, we think the X700 is better value based on our performance results, but we have serious misgivings about cards that get as hot as these two do under heavy gaming conditions.

Gigabyte GV-RX70P256V

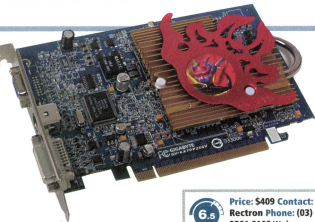
So far, ATI's Radeon X700 Pro graphics processor unit hasn't compared well against the Nvidia GeForce 6600 GT, losing on both price and performance. Unfortunately, that continued again this month.

Packing 256MB of memory, the RX70P256V only managed 40fps on DOOM 3 at 1,024 by 768-pixel resolution on our AMD Athlon 64 3800+ test PC. However, what we found even more strange was the fact that the lower clock speed Radeon X700 from Gigabyte managed to outperform it on DOOM 3 on

the same system. Our DirectX 8 results on Unreal Tournament 2003 (UT2003) were more predictable, with the X700 Pro leading the X700 by about 10%.

From our testing we believe ATI may have managed to tweak the latest unified drivers to improve the overall performance of the X700 series.

The most notable feature of this card is the lack of a fan. Gigabyte has really bulked up on the heatsinks to make this a silent performer. A heatpipe joins the four heatsinks, two of which are on the front, with



Price: \$409 **Contact:** Rectron Phone: (03) 9561 6166 **Web:** www.gigabyte.com.tw
+ Can handle DOOM 3 - Pricey
- Heatsink gets too hot

another two on the back.

However, from our testing, we're not convinced of its long-term survival. Directly after testing, we found the card was so hot, it was impossible to touch for more than a couple of seconds. All up, neither of

these cards are as fast as a GeForce 6600 GT. They're also a bit too pricey and way too hot for our liking. ☹

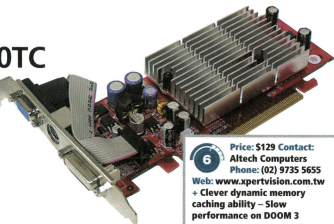
XpertVision GeForce 6200TC

XpertVision is the first to release Nvidia's new TurboCache model of the GeForce 6200 graphics chip. TurboCache is a new Nvidia technology that enables card manufacturers to provide cheaper cards with less onboard memory. What these cards do is actually leech some of your PC's system memory through the PCI Express bus—it's a similar concept to most integrated graphics solutions.

The 6200TC comes with only 64MB of memory, so it's best used on systems with at least 512MB of memory. With only 256MB of system memory, your CPU's performance would begin

to drop off because of the lesser memory, somewhat negating the benefits of adding that memory to the graphics card. Actually, 64MB of memory is quite generous as far as TurboCache models are concerned, and you can expect to see 16MB and 32MB versions also appear on the market.

While the concept itself isn't new (BIOS options to adjust memory caching for AGP have been around for some time), Nvidia's approach is new (and patented) by providing dynamic allocation of memory to the card; put simply, it only steals memory when it needs it.



Price: \$129 Contact:
6 **Altech Computers**
Phone: (02) 9735 5655
Web: www.xpervision.com.tw
+ Clever dynamic memory
caching ability - Slow
performance on DOOM 3

Even though the GeForce 6200 replaces the GeForce FX 5200, it barely has enough grunt to handle DOOM 3. Its performance at 1,024 by 768-pixel resolution on the basic timedemo test was only 19.4fps on our AMD Athlon 64 3800+

test system, rising to 40.5fps at 640 by 480 pixels and dropping to 12.3fps at 1,280 by 1,024 pixels. That said, it's still better value than ABIT's R9550-Guru below.

ABIT R9550-Guru

ABIT's Xuru series of graphics cards is aimed at the serious gamer, providing impressive overclocking and hardware monitoring features such as dynamic overclocking. That said, we don't think we can see a more pointless graphics chip to overclock than the Radeon 9550. Overclocking a 9550 is a bit like using premium unleaded fuel in your four-stroke mower. And from our testing, it has no place handling DirectX 9 games.

It performed modestly on

UT2003 and would be playable at 1,280 by 1,024-pixel resolution in a pinch, but there's a big difference between DirectX 8 and DirectX 9 performance.

The card's 14.2fps score on DOOM 3's timedemo at 1,024 by 768 pixels makes it unusable at this resolution. Moreover, even at 640 by 480 pixels, it can only muster 27.1fps.

The card comes with TV-out, DVI and VGA ports, along with Cyberlink PowerDVD 5.0 DVD movie playback software.



Price: \$129 Contact:
4 **Altech Computers**
Phone: (02) 9735 5655
Web: www.abit.com.tw + Can
handle DirectX 8 or older games
- Too slow for DOOM 3 - Too old

If it has a saving grace, it's the low price tag, selling from some vendors for as little as \$129, but we can't see the point. Either a card is fast enough for

handling the latest 3D games or it isn't. And this one isn't, regardless of the price. If your budget is tight, the XpertVision 6200TC is better value. **55**

GRAPHICS CARDS: HOW THEY COMPARE

Model	ABIT R9550-Guru	Gigabyte GV-N66T128D	Gigabyte GV-RX70128D	Gigabyte GV-RX70P256V	Leadtek WinFast A6600 GT TDH	XpertVision GeForce 6200TC
Price	\$129	\$319	\$259	\$409	\$309	\$129
GPU make and model	ATI Radeon 9550	Nvidia GeForce 6600 GT	ATI Radeon X700	ATI Radeon X700 Pro	Nvidia GeForce 6600 GT	Nvidia GeForce 6200 TC
Memory	128MB	128MB	128MB	256MB	128MB	64MB
Slot type	AGPBX	AGPBX	PCI Express x16	PCI Express x16	AGPBX	PCI Express x16
Slot size	Single	Single	Single	Single	Single	Single
Cooling system	Heatsink/fan	Heatsink/fan	Heatsink/heatpipe	Heatsink/heatpipe	Heatsink/fan	Heatsink/fan
TEST SETTINGS						
Motherboard	Gigabyte GA-K8NS Ultra-939	Gigabyte GA-K8NS Ultra-939	Gigabyte GA-K8NXP-SLI	Gigabyte GA-K8NXP-SLI	Gigabyte GA-K8NS Ultra-939	Gigabyte GA-K8NXP-SLI
TEST RESULTS						
DOOM 3 timedemo demo1 - 640 by 480	27.1	103.5	74.7	72.1	101.4	40.5
DOOM 3 timedemo demo1 - 1,024 by 768	14.2	82.6	46.4	40	80.2	19.4
DOOM 3 timedemo demo1 - 1,280 by 1,024	Not tested	60.6	31.2	26.9	57.9	12.3
Unreal Tournament 2003 1,024 by 768 average/low fps	87.3/52.6	253.6/82.1	200.7/48.4	219.0/63.1	250.8/117.4	97.4/38.7
Unreal Tournament 2003 1,280 by 1,024 average/low fps	57.7/36.0	227.6/55.1	139.9/55.6	154.9/74.9	196.1/79.0	63.7/33.9

Note: All cards tested with AMD Athlon 64 3800+ CPU, 1GB DDR400 memory, Western Digital WD400JB 40GB 7,200rpm 8MB cache hard disk drive and Windows XP Pro with DirectX 9.0c.

Each-way bet for AMD

Nvidia's new nForce4 chipset now gives AMD fans the choice of PCI Express or AGP8X graphics. **Darren Yates** reports.

Gigabyte GA-K8NS Ultra-939

The GA-K8NS is based on Nvidia's previous-generation nForce3 Ultra chipset, but it still packs a serious punch and comfortably outperformed the new GA-K8NXP-SLI board. Combining AGP8X with AMD's Athlon 64 platform looks to be the ultimate in 3D gaming performance. We managed to get better scores from DOOM 3 combining this board with Gigabyte's new GV-N66T128D

GeForce 6600 GT card than we could with its K8NXP-SLI and GV-3D1 combo.

The GA-K8NS has some great features including IEEE 1394b and Gigabyte's own RAID Deluxe, a technology that allows up to six hard drives (two SATA and four IDE) to be connected in a RAID 0, RAID 1 or RAID 0+1.

Even with a single Western Digital 40GB hard drive, it managed excellent scores on

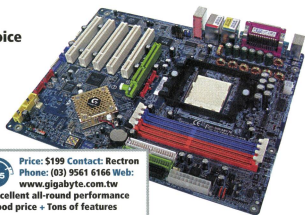
8.5 Price: \$199 Contact: Rectron
Phone: (03) 9561 6166 Web:
www.gigabyte.com.tw
+ Excellent all-round performance
+ Good price + Tons of features

both business and multimedia content creation applications.

You don't get PCI Express, but we haven't seen any conclusive evidence so far that

it's actually worth the effort yet.

nForce4 and SLI are forcing prices down on older nForce3 technology, and at \$199, the GA-K8NS is an excellent buy.



Gigabyte GA-K8NXP-SLI and GV-3D1 combo

Vendors are going to extraordinary lengths to lock buyers into their brand, as this combo from Gigabyte shows.

The new GA-K8NXP-SLI board is based on Nvidia's own nForce4 SLI chipset. SLI stands for Scalable Link Interface and it's a technology that allows two PCI Express graphics cards to work in tandem to produce better performance. In principal, it's very similar to the

Scan Line Interleave (SLI) technology developed by 3dfx in the late 1990s and later bought by Nvidia.

The nForce4 chipset brings all of the latest peripheral features to the AMD Athlon 64 platform for the first time, such as PCI Express, as well as other exotic add-ons including IEEE 1394b, the new 800Mbps FireWire serial interface, and Serial ATA II, with its 3Gbps data

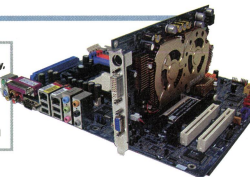
6.5 Price: \$950; motherboard only.
\$349 Contact:
Rectron Phone: (03) 9561
6166 Web: www.gigabyte.com.tw + Loaded with features - Sluggish performance - Overpriced

transfer speed. Both are twice as fast as their respective originals. You also get eight-channel audio and dual Gigabit Ethernet LAN ports. With this bundle comes Gigabyte's unique GV-3D1 graphics card, which features

two GeForce 6600 GT GPUs running in SLI mode on the one card. It's a first, but the card can only run in this board, hence the bundle. The bigger problem for Gigabyte is that our test sample didn't seem to perform up to scratch, despite running the latest BIOS and driver.

The DOOM 3 performance in particular was very ordinary, and below what we achieve with just a single 6600 GT GPU and Gigabyte's own GA-K8NS Ultra-939. The board is also slower than the Ultra-939 on business and multimedia applications.

Given the less than spectacular results we achieved in our original testing of dual SLI cards last month, and the cost of boards and cards associated with SLI, we're coming closer to one particular conclusion — give it a miss.



MOTHERBOARDS: HOW THEY COMPARE

Model	Gigabyte GA-K8NXP-SLI	Gigabyte GA-K8NS Ultra-939
Processor socket format	Socket 939	Socket 939
Chipset	Nvidia nForce4 SLI	Nvidia nForce3 Ultra
Graphics expansion slot	PCI Express (SLI)	AGP8X
FireWire/USB 2.0 ports	3/10	3/8
SATA/IDE ports	8/2	4/2
TEST RESULTS		
VeriTest Business Winstone 2002	40.2	43.8
VeriTest Multimedia Content Creation Winstone 2003	48.3	54
DOOM 3 timedemo demo1 - 1,024 by 768	80.5	82.6
DOOM 3 timedemo demo1 - 1,280 by 1,024	61.5	60.6
Unreal Tournament 2003 1,024 by 768 average/low fps	209.3/59.9	253.6/82.1
Unreal Tournament 2003 1,280 by 1,024 average/low fps	207.9/59.1	194.2/55.0

Escaping from Butcher Bay

Julian Schoffel breaks out his shiv to guide you through *The Chronicles of Riddick: Escape From Butcher Bay*.

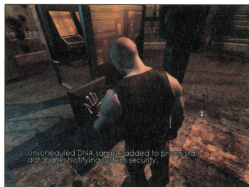
The *Chronicles of Riddick: Escape From Butcher Bay* (COR) is based around the character of

Riddick, the anti-hero from the popular sci-fi film *Pitch Black* and star of the recent Hollywood stinker *The Chronicles of Riddick*. In the films, Vin Diesel plays Riddick and fans will be happy to know he reprises his role in the game.

Prison life

At the start of COR, Riddick is in the custody of a bounty hunter called Johns, who is transporting Riddick to Butcher Bay, the toughest maximum security prison in the galaxy. As the title suggests, the entire game is centred on Riddick's attempts to escape from this hellish slammer.

On frequent occasions, Riddick is free to mix with the other Butcher Bay inmates and take on all manner of miniquests in return for information, weapons or equipment. The quests usually consist of performing certain tasks for fellow prisoners such as killing another inmate, exposing a snitch, and even using a bomb to unleash subterranean monsters. Naturally, Butcher Bay has its own gang hierarchy and the



Riddick finds a way to access the DNA-encoded weapons.

prisoners all have their own agendas and affiliations, so if you help one group you can expect to become the target of another. This (anti)social interaction is an integral part of the game.

Special abilities

Riddick possesses a special stealth ability that increases his field of vision and allows him to hear the heartbeat of anyone nearby. In this mode, Riddick can sneak up behind unwary opponents and instantly snap their neck.

During the course of the game, Riddick also gains his infamous 'eye shine' ability, which allows him to see in the

dark. This provides a huge tactical advantage whenever he can turn off the lights, allowing him to stalk opponents. However, eye shine is a double-edged sword because it makes any nearby light sources appear dazzlingly bright.

He is also capable of a number of devastating special moves like forcing a guard to blow his own head off, or swinging along railings and dropping down on opponents from above.

Weapons

Many of the weapons in COR are DNA encoded and, as a consequence, off-limits to Riddick. However, as the game

unfolds, he manages to get his hands on an assortment of lethal implements, including an array of improvised shivs and knuckledusters, a handgun, shotgun, assault rifle, grenades, and even a monstrosity powerful assault robot!

Tools of the trade

When you're attempting to break out of a maximum security prison, you want to draw as little attention to yourself as possible. To keep a low profile, Riddick will have to make use of the prison's vast network of tunnels, shafts and ventilation ducts. To gain access to these areas, he will need to find a steady supply of vent tools and keycards. These can be obtained in the various places in the gameworld or from the resident guards.

General tips

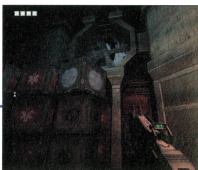
Prisoners aren't allowed to carry weapons in Butcher Bay. If you have a shiv or set of knuckledusters, make sure you un-equip them before moving within close proximity of guards or security cameras.

When you're fighting, don't just pound the mouse button;



Interact with other prison inmates.

Make use of the prison's ventilation ducts.





Riddick's hand-to-hand combat skills are second to none.

instead, use combinations and always remember to block (using the right mouse button). To make Riddick throw different punches while fist fighting, hold down a directional key and press the left mouse button to execute (left hook is A, right hook is D, uppercut is S and elbow is W).

Riddick is capable of using lethal finishing moves that vary depending on the situation at hand. To execute one of these moves, you have to get the timing just right. Try waiting for your opponent to attack and then tap the left and right mouse buttons one after the other. If Riddick is fighting hand to hand, he will grab an opponent's fist and king hit him; if an opponent is holding a weapon, he will grab the gun and force his foe to shoot himself in the head and so on.

Some areas are only accessible by climbing. To make Riddick climb, simply get up close to a crate, ladder or handrail and press the 'use' key (E by default). Remember, he can also kill an opponent instantly by dropping down on

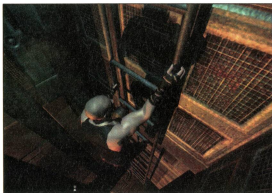
top of them from a ladder or handrail.

Riddick can ambush opponents by entering stealth mode (using the C key), sneaking up behind them, grabbing them (by holding down the right mouse button) and snapping their neck (by tapping the E key).

Later in the game, you obtain a tranquilliser gun, which only stuns the target momentarily. To finish off a stunned foe, Riddick will need to stomp on their head within a set time limit.

On occasion, he will need to hide bodies to stop other nearby guards from going into a heightened state of alert. To do this, simply stand over a body and press the E key, and then drag it to a dark, isolated area. To release the body, simply hit the E key once again.

You can boost your health at the various 'Nano-med' health stations scattered throughout the game. You'll sometimes need to recharge a health station using a Nano-med cartridge (which you'll find in the gameworld) before it will work.



Use the E key to climb ladders.

Getting started: level 1 'Escape'

At the start of the game, Riddick is in the custody of a bounty hunter named Johns who's under the impression he'll receive a reward for delivering Riddick to Butcher Bay.

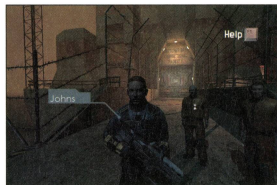
After the cut scene ends, Riddick will find himself standing in a landing zone just outside Butcher Bay. Look around and you'll see a couple of other prisoners in the immediate vicinity (Lambert and Pixie), along with Johns who's holding an assault rifle. Talk to Johns (approach him and press the E key) and, once the dialogue sequence ends, he will turn away (big mistake). At this point, one of your fellow prisoners will quietly suggest that you sneak up behind Johns and snap his neck.

Approach Johns from behind and when you're close, hit the right mouse button. This will cause Riddick to grab him in a headlock. Now tap the E key to break his neck. When Johns falls to the ground, one of the prisoners will try to pick up his assault rifle. Unfortunately, the

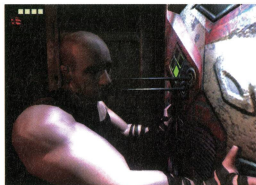
rifle is DNA encoded and it gives the prisoner a lethal electric shock. The guards from the prison will now open fire, so quickly turn around and follow the surviving prisoner who manages to open an entry hatch before being shot dead.

Leap down through the hatch and make your way into the shaft. Almost immediately, you'll have to jump over some pipes (press the spacebar to jump) and then climb down a ladder (press the E key to climb up and down ladders).

You'll now find yourself standing atop a large piece of machinery, overlooking a room. In the immediate area, you'll see a packet of cigarettes; pick them up if you want (approach them and press the E key). These packets of smokes turn up at regular intervals during the course of COR. Collecting them will unlock special goodies (like artwork and movie trailers) within the game. Now jump down off the machinery and approach the technician. He will immediately attack; kill him using the combat techniques we described and grab his security card. Use it to open the ②



Kill Johns by breaking his neck.



Use Nano-med stations to boost your health.



Relieve this guard of his shotgun...

nearby doorway.

You should now find yourself in a darkened area looking out into a brightly lit corridor. Stay in the shadows and hit the C key to enter stealth mode. Wait for the guard to go past and then sneak up behind him. When you're relatively close, right-click to grab him in a headlock and tap the E key to break his neck. Pick up the guard's vent tool and drag his body into the shadowy area near the door.

Once you've hidden the body, move down the corridor and approach the crates to your left. Look up; you'll see an air duct overhead. Climb the crates (using the E key) and then grab the overhead handrails (once again, look up and press the E key). Riddick will now monkey-swing across the handrails towards the ventilation duct on

the far side of the room.

When you're about halfway across the handrails, another guard will enter the room below. When he's directly underneath, press the E key to leap down on him to kill him instantly. Make your way back up to the overhead handrails and climb across to the ventilation duct. Use the vent tool to open the duct and climb in.

Follow the ventilation shaft until you come to a metallic grate. Kick out the grate (using the E key) and jump down into the room below. On the floor you'll see a Nano-med cartridge; pick it up and insert it in the nearby Nano-med health station. Use the station to recharge Riddick's health and then make your way down the left-hand corridor and go through the doorway.

Quietly move around the corner to your left and you'll see a guard holding a shotgun. Confront the guard and kill him (try using his own weapon against him). Pick up the cigarettes and then climb onto the nearby metal crates. Look up and grab the handrail. Swing along the handrail to your right until you reach a gap in the wire fence, and then climb up onto the catwalk above (using the E key). Now move into the adjacent room and take the elevator to the next level.

In this area, you'll see an armed guard patrolling directly ahead of you. Wait until he walks past and then sneak up behind him. Break his neck and take his shotgun. At this point, Riddick will mention something about 'smelling the sewer'. Climb down the nearby ladder and move in front of the locked

hatch. Shoot the lock off with the shotgun and then hit the F key to activate the weapon's built-in flashlight.

Make Riddick crouch (using the C key) and then enter the sewerage tunnel. After a while, you'll come to a T-intersection and you'll see the flashlight of a searching guard. Kill the guard with the shotgun (aim and press the left mouse button) and then move down the tunnel to your right. Be cautious, as there are more guards up ahead. Aside from shooting the guards directly, you can use the shotgun to detonate the explosive barrels lining the walls. These will kill any hostiles in the immediate vicinity.

Take a left and then a right. At this point, you should see a white light at the end of the tunnel. Keep moving towards the light and get ready for a plot twist...



Shoot the lock open and enter the tunnel.

REVIEW THE CHRONICLES OF RIDDICK: ESCAPE FROM BUTCHER BAY

The Chronicles of Riddick: Escape From Butcher Bay (COR) was initially released on Xbox last year. It was quite simply one of the best Xbox games we've ever seen! Now, COR has been ported over to the PC and the big question is: has anything been lost in the translation?

COR is based around the character of Riddick, played by Vin Diesel. From the get-go, I would like to make one thing clear: COR is infinitely superior to the recent abysmal Hollywood flick, The Chronicles of Riddick.

In terms of gameplay, the PC version of COR is virtually identical to its Xbox sibling. The PC version does have a few extra aesthetic trimmings though, including a brand-new level, some fresh 'cigarette pack' collectibles and a special developer's commentary.

Of course, the port also exploits the superior visual grunt of the PC



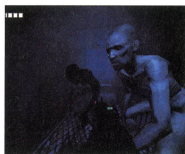
Kill or be killed...



Price: \$69.95
Contact: Vivendi
Universal Games
Phone: (02) 9207 0522 Web:
www.riddickgame.com
Classification: MA (15+)

platform and, as a consequence, looks even better than the Xbox version. Disappointingly, the PC version of COR still has no multiplayer component of any kind.

The Chronicles of Riddick: Escape From Butcher Bay melds interesting characters with a superbly paced storyline in much the same way that Half-Life did. The end result is a game that gleefully lays waste to genre conventions, creating its own unique combination of action, stealth and high adventure. If you missed it on Xbox, then go out and buy it immediately!



These creepy bastards live in the pit.



Blast off!



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- Supports the AGP 8X and AGP 4x standard, True Microsoft® DX9 Performance for today's games and full support for the latest OpenGL® functionality

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Features: SMARTSHADER, VIDEO IMMERSION and FULLSTREAM

RADEON 9200 SE

- 128MB DDR memory
- Driven by Quadpipe architecture
- Supports the AGP 8X and AGP 4x standard, DirectX® 9.0, OpenGL® functionality

Features: SMARTSHADER, SMOOTHVISION, VIDEOSHADER and FULLSTREAM

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- 256-bit quad-channel GDDR3 memory interface
- Twelve Xtreme parallel pixel pipelines
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- Six programmable vertex shader pipelines



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Conquer terrorism

Julian Schoffel previews the hottest upcoming games, starting with a modern twist on Command & Conquer.

Platform: PC Contact: Atari
Australia Phone: 1800 060 605
Web: www.atari.com/actofwar/
Release date: March 2005

Act of War: Direct Action

Act of War: Direct Action (AOW) is a real-time strategy (RTS) game very much in the vein of Command & Conquer. AOW is being developed by Eugen Systems for Atari and is due out in March. We were lucky enough to snare ourselves a pre-release build and, for the most part, were quite impressed by what we saw.

In a stunningly original twist, AOW's futuristic storyline (penned by popular author Dale Brown) revolves around terrorists and a world energy crisis (yes, there may indeed have been a hint of sarcasm there). As the game begins, fuel prices in the US have skyrocketed to over \$7 a gallon. Terrorist factions have taken advantage of the resulting instability by launching a brazen series of attacks on numerous global targets. In response to this threat, the US has launched a special

operation known as Taskforce Talon, with the dual aims of enforcing homeland security and tracking down the sinister consortium financing the terrorists. The game's single-player campaign encompasses a variety of international settings including Egypt, London, Russia and Washington.

The first thing we noticed about AOW was the game's striking 3D visuals. Eugen have cut no corners in creating what has to be one of the best-looking RTS offerings to date! For starters, the game maps are vast and sport lavish amounts of detail. The camera controls are also extremely well implemented and you can zoom or rotate your viewpoint simply by rolling or clicking the mouse wheel. In a somewhat retro touch, AOW incorporates full-motion video footage into the game engine. On the down side, we noticed a few graphical problems (like shadows being thrown the wrong way), but this



A helicopter transport delivers our brand-new tank.

was a preview build, so hopefully these glitches will be addressed before the final release.

Core gameplay consists of traditional RTS fare including the obligatory base-building and resource management components. AOW's control interface appears to be quite intuitive, although trying to deselect individual units is unnecessarily fiddly. The game features a dynamic NAV indicator, which automatically hops around the screen to guide you to your next objective. AOW's pacing is fast and furious, although things tend to slow down a bit whenever the base-building process kicks in.

AOW features a plethora of conventional weaponry (such as tanks, helicopters, Humvees) with some futuristic firepower (like drones and shielded units)

thrown in for good measure. In an interesting twist, you can even capture enemy soldiers and interrogate them.

The final version of AOW will feature multiplayer support for up to eight players via a LAN or the Internet. The game will also include a built-in map editor.

If our initial impressions are anything to go by, then AOW looks like an updated version of the classic Command & Conquer-style RTS game. The game looked stunning, although the gameplay felt a bit stale. However, we'll reserve our final judgement until after we've played the commercial release.



The game features a cutting-edge 3D engine.



You fight in a variety of different terrains.

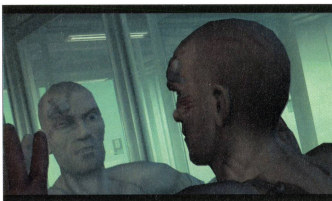
Second Sight

Second Sight originally came out on the Xbox and PS2 platforms late last year, and Codemasters are now putting the finishing touches on a PC port of the game. Atari were kind enough to send us a preview build of the PC version, so we thought we'd share our initial impressions of the game.

Second Sight is best described as a story-driven, stealth/action hybrid with a few paranormal elements thrown in for good measure. In the game, you control the enigmatic character of John Vattic. At the start, Vattic emerges from a coma in a high-security US research facility. He is heavily bandaged and it's obvious that he's been subjected to some type of brutal surgery. During the course of the game, Vattic gradually remembers fragments of his troubled past.

It turns out that Vattic was formerly a medical researcher, recruited to take part in a covert military investigation. This centred on the sinister psychic experiments of a man known as Dr Grienko, located deep in Siberia. Unfortunately, Vattic's mission went horribly wrong, leaving him with a set of bizarre psychic abilities he can't explain.

Second Sight was obviously devised first and foremost for the PS2 platform. Why? Because by Xbox and PC standards, the game's 3D visuals are extremely primitive. Fortunately, the



"What the hell has happened to me?"

Vattic can use computer consoles to manipulate the gameworld.

gameplay dynamics and interface fare considerably better.

Basic gameplay consists of moving Vattic about the expansive 3D environments, interacting with the gameworld and engaging in combat. You can switch your viewpoint between two third-person perspectives: up close and a sort of bird's-eye view. The former is fine for normal movement, while the latter comes in handy for situations

requiring planning and the use of stealth.

While the game's controls sport the odd laginess that seems to plague many console ports, the interface itself translates to the PC surprisingly well. You rely on the traditional WASD keys to control basic movement, while the mouse buttons and wheel are used to fire weapons and cycle through Vattic's psychic (PSI) powers. The game includes quite a few other key commands, but most

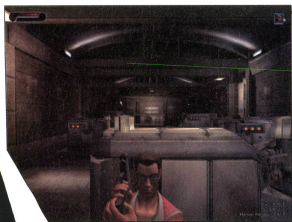
Platform: PC Contact: Atari
Australia Phone: 1800 060 605
Web: www.codemasters.co.uk/
second sight Release date:
March 2005

players should get the hang of things fairly quickly.

Vattic's array of psychic powers are the game's biggest drawcard, and they allow you to overcome obstacles in a variety of different and often creative ways. For example, to deal with a guard, you could either eliminate him using 'PSI pulse', control him using 'possession' or trick him into thinking you're not really there using 'charm'. Apart from his prodigious psychic powers, Vattic also possesses some impressive stealth and combat abilities. With so many options at your disposal, you will never feel locked into a linear route through the game.

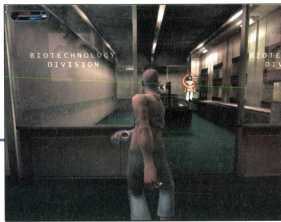
On a negative note, Second Sight doesn't seem to have a proper savegame feature, forcing you to rely on a half-arsed console checkpoint system. Some of the dialogue is also fairly hammy and on at least one occasion, the voice actor playing Vattic abruptly changes his delivery style (either that or it's a different actor entirely). Needless to say, this doesn't do a lot for continuity or suspension of disbelief.

Apart from a couple of minor hiccups, the PC version of Second Sight is shaping up very well indeed. Stay tuned for a full review of the game in an upcoming issue. ➤



The game translates to the PC surprisingly well.

Vattic can use his PSI powers in a number of different ways.



❁ Myst V: End of Ages

Fans of Myst will be sad to hear that Cyan Worlds have recently announced the final instalment of this much-loved adventure/puzzle series. However, Rand Miller, co-creator of Myst and founder of Cyan Worlds, will lead the development team, which should mean that the Myst series goes out in fitting style.

Myst V: End of Ages will pick up the action immediately after the original game ended. You will be presented with the privilege, challenge and responsibility of restoring the lost empire of the D'ni: an ancient civilisation of people who thrived for thousands of years, but later met with a great catastrophe.

Like its predecessors, Myst V: End of Ages will feature a stunningly detailed set of 3D

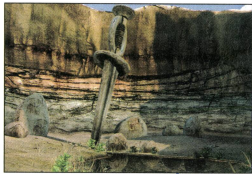


rendered environments for you to explore. To do the series justice, Cyan are putting special effort into the final game's storyline and puzzles.

According to Rand Miller: "Myst V: End of Ages follows the Myst storyline to its conclusion — closing the book on the Ages of Myst... To complete this

circle of Myst we've embraced the idea of something old and something new. New in regard to pushing forward in areas of interface and technology. And old — getting back to the simple exploration that made Myst so magical."

Myst V: End of Ages is due out later this year.



The Myst series will draw to a close with Myst V: End of Ages.

The game will feature a stunning set of 3D-rendered environments.

Platform: PC, Mac
Contact: Ubisoft
Phone: (02) 8587 1800
Web: <http://myst5.ubi.com>
Release date: October/November 2005

Worms 4: Mayhem

Developed by the original Team 17 design crew, Worms 4: Mayhem promises to take the series back to its roots.

In Worms 4, you will be able to create your own weapons using the game's brand-new Weapons Factory. With this device, it will be possible to concoct all manner of bizarre military hardware including the likes of exploding chickens and toilet bombs. The game will also feature a beefed-up, readymade arsenal including poison arrows, sentry guns and the bovine blitz (which unleashes a bombing raid of cows).

Your customisation options don't stop at crafting new weapons, and for the first time, you'll be able to change the appearance of your worms, choosing their hair, hands, faces, glasses and dying words, as they wriggle off the mortal coil...

Worms 4's selection of multiplayer and single-player



maps will be spread across five zones, each with its own unique theme. These include: Jurassic, Camelot, Arabian, Construction and the Wild West. The game will also feature destructible environments. Worms 4's single-player campaign will span a total of 25 missions. All of the game's single-player levels will be available in multiplayer mode, along with a further set of 20 multiplayer-specific maps.

Create your own weapons.

Customise the appearance of your worms.



Team 17 have also put special effort into refining the game's camera controls and beefing up the 3D visuals. Worms 4: Mayhem looks like a lot of fun and we look forward to bringing you a full review in coming months.

Platform: PC, Xbox, PS2
Contact: Atari Australia
Phone: 1800 060 605
Web: www.codemasters.co.uk/worms/
Release date: April/May 2005

Half-Life 2 mods

Julian Schoffel shows how to tweak the best PC game ever.

Requirements: Full version of Half-Life 2 and a Steam account
Difficulty level: Easy to medium

By now, many of you will have played through Half-Life 2 at least once. Thankfully, there's a whole stack of great Half-Life 2 mods available for download on the Net. These include everything from custom-built maps to fully fledged game editors. Using these mods you can breathe new life into the game.

Below is a short guide to Garry's Mod v6c, currently one of the most popular Half-Life 2 mods out there. We've also included some other Half-Life 2 mods on this month's cover discs, so be sure to check them out as well.

As is always the case with game modifications, *use at your own risk!* PC User cannot be held responsible for any problems or damage that the installation or use of player-created mods may incur. If you do encounter any problems, try uninstalling any mods, or if this doesn't work, try uninstalling and reinstalling the game itself.

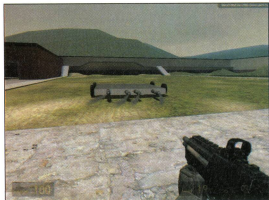
● Garry's Mod v6c

Garry's Mod (currently in version 6c at the time of printing) is an entertaining mod for Half-Life 2, which lets you completely manipulate the game's physics system. It also allows you to build rocket-powered vehicles, attach balloons to objects, manipulate other non-player characters in the gameworld, spray-paint the gameworld using a variety of different materials (such as blood and even bird crap), attach objects to flying scanners and much more!

● Installation

Installing this mod is very simple: just download the latest version of the mod file from the Web site at www.garry.tv/garrysmo/ (it's only around 3.2MB in size), double-click the executable, follow the on-screen instructions and Bob's your uncle.

To play Garry's Mod, just start Steam and select 'Play Games'. Next, double-click on 'garrysmo' under the Games menu to load up your newly installed mod.



You just created a simple, rocket-powered sled!



Muck around with other non-player characters in the gameworld.

● Build a rocket-powered sled

Start Garry's Mod (if you receive an error message, just ignore it and click OK). Click Start → New Game. The game will start with the help menu maximised. To get rid of it, just click on the Close button.

You'll now find yourself in a large arena-sized map. Turn left and you'll see a number of different switch shapes on the wall. There's a platform on the ground next to it. Pushing these switches will create new objects in the gameworld. The shape of each switch corresponds to the shape of the object created.

● Step 1

Push a large square-shaped switch to create a square platform. Go to the weapons menu and equip the 'manipulator physics gun' (you'll find it under the first weapons slot). You can use this gun to move objects around. Just target them and left-click to move them.

● Step 2

Use the manipulator physics gun to pick up the square slab you just created, and drop it onto the ground in front of you. Go back to the weapons menu and select the wheel shotgun (you'll find it under the fourth weapons slot). You can aim the shotgun at the positions on the square slab where you want to place wheels. Fire the gun to create wheels at these positions. Place a minimum of two wheels on each side of the square slab. You have now created a basic sled.

● Step 3

Go back to the weapons menu and select the thrust shotgun (you'll find it under the fourth weapons slot). Aim it at the positions on your sled where you want to place gas canisters. Try placing a minimum of four gas canisters on one end of your sled. You now have a sled with gas canisters attached to one end, but the gas canisters need to be ignited to generate thrust.

● Step 4

Return to the weapons menu and select a normal weapon. In this instance, use the submachine gun (you'll find it under the third weapons slot). Fire it at the gas canisters to ignite them. Once the canisters have ignited, you'll see a jet of steam and your sled will start moving.

And that's it. You just created a simple, rocket-powered sled! Now how about attaching a few balloons to the sled to see what happens?

● General tips

If you make a mistake, you can use the 'multi-gun' tool to erase objects (you'll find it under the third weapons slot). Once you've equipped the multi-gun, just right-click to bring up a menu. Select 'Entity Remover' from the menu and fire the gun at any objects you want to remove. If your rocket sled gets stuck, just use the manipulator physics gun to move it around.

That's just a small sample of the sort of insane yet absurdly fun stuff you can get up to using this excellent little Half-Life 2 mod! ☺

Real treasure

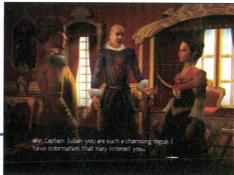
Sid Meier's Pirates!

Julian Schoffel reviews the hottest new games for PC and consoles.

Originally released on PC back in 1987, Sid Meier's Pirates is recognised as one of the greatest games of all time. This venerable classic has been given a complete makeover and re-released; the end result is

something rather special. In Pirates, you assume the role of a 17th century pirate captain. While Pirates does have a simplistic back-story, the game as a whole is very freeform. Gameplay is split up into six basic categories: port interaction (where you land at seaports, upgrade your ship, recruit seamen and so on), sea navigation (where you sail around the Caribbean), land battles, ship battles, duelling and dancing (where you

Romance the governor's daughter.



9 Platform: PC Price: \$89.95 Contact: Atari Australia Phone: 1800 060 605 Web: www.atari.com/ pirates/ Classification: G (8+) + Superb gameplay + Addictive - Sim-style dialogue

attempt to charm women with your dancing prowess). As the game progresses, you increase your reputation and gain access

to better ships, crews and equipment. The gameworld is vast and detailed, so there's always an interesting new area to explore. You can even download fresh content via the Internet. The 3D visuals are crisp, clean and rather pretty and the audio is also first-rate. With its compelling gameplay, the new incarnation of Pirates! is just as fiendishly fun and addictive as the original.

Nexus: The Jupiter Incident

Back in the early '90s, games like X-Wing and Wing Commander reigned supreme on the sales charts, but it's been a while since a decent space combat offering graced the PC. Nexus: The Jupiter Incident (NJI) is a tactical space combat game with a cutting-edge 3D engine and an enthralling storyline. While NJI isn't exactly a conventional space sim, it still has enough depth and class to reignite interest in this ailing genre. You control the character of Marcus Cromwell, renowned

commander of the massive warship Siletto. In this future, humanity is now controlled by huge corporations all striving to colonise the outer reaches of the galaxy. With so many competing interests, conflict is inevitable. Core gameplay consists of controlling multiple spaceships (up to 10 at any given time) in a series of compelling missions. NJI is a complex game and you have to micromanage your ships' personnel, engine and weapons systems. Much of the game is viewed on a tactical

The visuals are quite stunning.



9 Platform: PC Price: \$89.95 Contact: Vivendi Universal Games Phone: (02) 9207 0522 Web: www.nexusthegame.com Classification: G (8+) + Great storyline + Excellent control interface - Slow pace

battle map and orders are executed via an intuitive mouse-controlled interface. The in-game visuals are quite magnificent, and it often feels

like you're watching a spectacular sci-fi movie unfold! The game also features a solid multiplayer component. On a negative note, the pace of NJI is rather slow. If you're willing to persevere, the game is extremely rewarding nonetheless.

Prince of Persia: Warrior Within



A dark and broody action/adventure.

Warrior Within (WW) is the follow-up to Ubisoft's excellent Prince of Persia: The Sands of Time released last year. In WW, the Prince finds himself pursued by an immortal creature known as the Dahaka who, for reasons unknown, wants to make a necklace out of the Prince's internal organs.

To defeat the Dahaka, the Prince must embark on a journey through time. WW doesn't stray

too far from the series' addictive mix of frenetic combat, spectacular action and grand adventure. To this end, you will once again find yourself travelling through a series of exotic environments, negotiating hazardous terrain and fighting hordes of creatures. Compared to its predecessor, WW features a much darker, more violent tone. In The Sands of Time, the Prince was a debonaire, 'devil may care' kind of hero. In WW, he's a bit of an

8 Platform: Xbox Price: \$99.95 Contact: Ubisoft Phone: (02) 8587 1800 Web: www.princeofpersiagame.com Classification: MA (15+) + New moves and special attacks + Looks great - Overemphasis on violence and gore

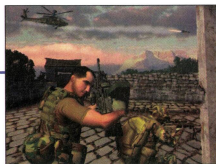
arrogant punk. The game also puts a bit too much emphasis on gory combat. Minor flaws aside, Warrior Within is a great-looking action/adventure game that should please all but the most picky players.

Tom Clancy's Ghost Recon 2

Tom Clancy's Ghost Recon 2 (GR2) is a meat and potatoes 3D action offering with some basic tactical combat elements thrown in for good measure. The game takes place in North Korea, where the unpredictable General Jung has just gained control of the country's nuclear arsenal. A multinational expeditionary force led by the US is sent in to solve the problem. Unlike its predecessor, GR2 doesn't allow you to have direct control over your squad-mates. Instead, this feature is

limited to one character only, with the option of issuing simplistic squad-level commands (such as flank left, flank right, suppress and so on) to your three team-mates. If your character is killed, it's game over. While the original Ghost Recon was strictly first person, GR2 is viewed from a third-person perspective, although you have the option of reverting back to first-person if you wish. While the 3D visuals are competent, they're certainly not cutting edge. The game features

Take on a mad North Korean general.



comprehensive support for Xbox Live and numerous multiplayer modes including deathmatch. If you're after a decent tactical 3D action game with a great multiplayer component, then Ghost Recon 2 is definitely worth a look.

7 Platform: Xbox Price: \$99.95 Contact: Ubisoft Phone: (02) 8587 1800 Web: www.ghostrecon.com/uk/ ghostrecon2/ Classification: MA (15+) + Comprehensive multiplayer support + Accessible - Dumbed down gameplay

Alexander

Alexander is a real-time strategy (RTS) game cobbled together to cash in on the Oliver Stone/Colin Farrell epic (and also flawed) film of the same name. As the title suggests, the game chronicles the historic feats of Alexander the Great. Short segments from the film are interspersed throughout the single-player campaign to flesh out the storyline. Alexander has a very meaty single-player campaign encompassing Macedonia, Persia and a couple



6 Platform: PC Price: \$89.95 Contact: Ubisoft Phone: (02) 8587 1800 Web: www.alexander-thegame.com Classification: MA (15+) + Decent visuals + Epic-scale battles - Formulaic gameplay

Alexander isn't exactly great.

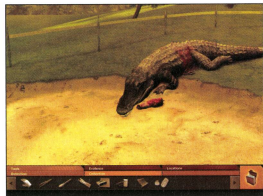
of other factions. Gameplay consists of fairly old-fashioned RTS fare, including the obligatory base-building and resource management

components. Unlike other RTS games, Alexander's engine supports the ability to wage epic-scale battles with up to 8,000 units onscreen at any

given time. One of the game's biggest flaws, however, involves unit artificial intelligence (AI); your forces often seem to have a mind of their own, failing to respond to your instructions in the heat of battle. Some poor AI pathfinding further compounds this problem. The game's multiplayer component includes support for up to eight players via the Internet or a LAN. Unfortunately, Alexander's slipshod structure and flawed AI mar what could have otherwise been an above average RTS offering.

CSI: Miami

CSI: Miami is the spin-off game based on the TV series of the same name; it follows in the footsteps of the two Las Vegas-based predecessors. No doubt there will also be a CSI: New York version out later this year. CSI: Miami uses the same game engine as CSI: Dark Motives; of course, this time around the developers have inserted the Miami cast members and tinted the game visuals with the strange orange hue that characterises the TV series. 'Insert' is an appropriate word here because the whole game feels like a cut and paste job cynically thrown together to



Oh joy, another CSI game...

please fans of the TV series. Once again, you wade through five separate murder investigations. Core gameplay consists of visiting crime scenes, interviewing witnesses, gathering evidence and heading back to the lab for analysis. As

was the case in previous games, you have access to a variety of fancy forensic tools like an electrostatic dust print lifter, luminol spray, ultraviolet torch and so on. As you would expect, the game features the entire cast of the TV show including David

5 Platform: PC Price: \$49.95 Contact: Ubisoft Phone: (02) 8587 1800 Web: <http://csi.miami.ubi.com> Classification: M (15+) + Moderately engaging storyline - Dated graphics - Clunky game engine

Caruso as Lieutenant Horatio Caine. Despite the pedigree of the actors, much of the dialogue sounds wooden and unconvincing. The game's dated graphics engine doesn't help matters either. Unfortunately, CSI: Miami inherits all the flaws of its predecessors and adds a few new ones to boot. This is a game for diehard fans of the TV series only; everyone else should probably steer clear.



BROADBAND & VoIP SUPERGUIDE

Building a small network

Before you buy anything, make sure you know what type of product is best for your network. Nathan Taylor explains.

Setting up a small network is not the challenge that it might first appear. With the right equipment and some basic knowledge, getting your network up and running is almost a plug-and-play exercise. The trick is to choose the right gear from the myriad of different products available, and the principles are much the same whether you're setting up the network in an office or in your home. Of course, most businesses have more PCs on the network than a home network, and network security is vital to businesses. However, these days, those using home networks should be just as concerned with security.

In this feature, we explain what you need to know to buy the right gear for your network. We've also reviewed two new wireless access points for those who only want to add wireless connectivity to their wired network or broadband modem. However, we strongly advise that you also consider the different integrated networking devices reviewed on page 50.

A basic four-port ADSL router like this can be had for less than \$120.

Switches, routers and modems

If you're not an experienced network builder, you may be wondering what the difference between a switch, router and modem is. The simple answer is that, on a small network, a switch is used to connect local area network PCs (the LAN); a router is used to connect those PCs to the Internet; and the modem is used to convert the signal from the type used on the LAN to the type used by the telephone network. A typical configuration goes thus: the ADSL line plugs into the ADSL modem; the ADSL modem plugs into the WAN port of the router; the router plugs into the switch; all the PCs also plug into the switch and talk to the Internet through the switch, across the router and up through the ADSL modem. (For small networks, it's not uncommon to have a single



Adding a wireless access point is an easy way to expand your existing network.

device that takes on the role of modem, router and switch all at once.)

However, if you plan to set up a network, it's worth knowing some of the more technical details of how all this works. To be a little more accurate, a switch is a high-speed device that is designed to connect incoming lines with outgoing lines, very much like a telephone switch. A message might come in from port one, which is designed to go out to port three. The switch simply connects those ports and allows the devices to communicate at line speed. Switches are useful for 'short haul' messages that don't require too many hops. We'll explain why in a moment, when we talk about layers.

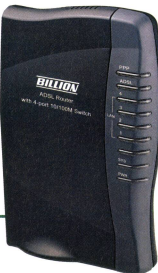
A router does a lot more. A router is what is called a store-forward device. It takes incoming messages, manipulates them and figures out the best way to get them to their destination. It can also perform operations on data, such as prioritising some kinds of data over others or blocking certain kinds of data. They can also be used as 'dial-in' devices for ISPs, talking through the modem to make a connection with the ISP and then to the Internet. Routers are slower and more expensive than switches, but they do much more.

Layers

Most switches are what are called Layer 2 switches (Layer 3 switches exist, but they're not really that useful for small networks). Layer 2, in this respect, refers to Ethernet. Ethernet is a networking standard that defines how to get data onto the wire, how to handle contention for bandwidth on the wire (that is, how to share the network with other devices) and how the data should be formatted. A message sent over Ethernet also has a source and destination address based on the Ethernet devices' unique identifiers (these are known as media access control (MAC) addresses), but no information about how to get there. Sending a message over Ethernet is like sending a letter with a name, but no address.

Switches handle this by keeping a temporary record of traffic coming in from the various ports. So, when a message comes in from port one, for instance, the switch makes a note of the source MAC address of that message. It then knows the MAC address of the PC connected to port one. Future messages directed at that PC will be sent to port one.

If the switch does not know the destination address—for example, if a message comes in





FAST TRACK BUYING THE RIGHT NETWORK GEAR

What do you have now?

I have nothing

I have an ADSL or cable modem

I have an ADSL router

I have a switch or a wireless access point

I have a router without an ADSL port

What you'll need

• An integrated ADSL router and switch with four or eight ports; wireless if desired

• A Fast (100Mbps) or Gigabit (1,000Mbps) Ethernet switch with at least as many ports as PCs, or a wireless access point

• A Fast (100Mbps) or Gigabit (1,000Mbps) Ethernet switch with at least as many ports as PCs, or a wireless access point

• An ADSL router (with or without wireless capabilities)

• An Ethernet-based ADSL modem (or an ADSL router running in bridged mode)

The setup

• The integrated router does it all. The ADSL line connects to the ADSL port of the router, and the PCs plug into the Ethernet ports or talk to it wirelessly. The Internet connection details are set up on the device and it acts as the dialer, firewall and address server for the network.

• On the PC to which the modem is connected, set up Internet Connection Sharing (or similar non-Microsoft service), along with firewall software. This PC will act as the router for the network. Your new switch or access point distributes the Internet access to the other PCs connected to the switch on your LAN.

• The router acts as the Internet connection sharing device and firewall. The ADSL line plugs into it and it connects to the ISP and provides IP addresses dynamically to the PCs on the network. The router plugs into one of the ports on your new switch, or into the Ethernet port on your access point.

• The ADSL router allows your PCs to connect to the Internet. The phone (ADSL) line plugs into the router, and the router plugs into your switch or access point. The ADSL router takes care of NAT, connecting to an ISP and basic firewall security.

• The ADSL modem acts as a bridge between the ADSL line and the router. The ADSL line plugs into the ADSL modem, which in turn plugs into the WAN port of your router using an Ethernet cable. The router does most of the work, connecting to the ISP, providing firewall protection and handling out NAT addresses. In effect, the ADSL modem just adds an ADSL port to the router. You may still need a switch or access point if you don't have one.

What to look for in the product

• Super G wireless (if you want wireless connectivity)
• VPN = ADSL2+ support
• Quality of Service
• Management (if desired)
• Enough ports to satisfy current and future wired connectivity needs

• Super G wireless (for access points)
• WPA support in the access point
• Enough ports to satisfy current and future wired connectivity needs

• Super G wireless (for access points)
• WPA support in the access point
• Enough ports to satisfy current and future wired connectivity needs

• Super G wireless (if you want wireless connectivity)
• Stateful packet inspecting (SPI) firewall
• VPN = ADSL2+ support
• Quality of Service
• Management (if desired)
• An integrated switch (with a few extra Ethernet ports if you need them)

• Ethernet, not USB
• ADSL2+ support

for a PC that has not been previously heard from and is therefore not in the address database — it will broadcast the message on all ports. When (and if) the destination computer responds, the switch will take a note of the port, and future messages directed to that computer will be sent out on that port only.

The ability of a switch to keep track of MAC addresses and port number is limited. If another switch is connected to a port, more than one PC might be sending messages through a single port. Imagine if it had to keep a catalogue of every PC on the Internet!

That's where Layer 3 kicks in. For our purposes, Layer 3 refers to the Internet Protocol (IP). IP not only contains a source and destination address, but a mechanism for data to find its way to the destination without having pre-existing

knowledge of an exact route. Figuratively speaking, it's the address on the letter. The way IP does this is a little complicated, but it's based on a hierarchy of networks. Routers, which operate at Layer 3, are designed to send messages over IP.

When your PC sends a message across the network, it will include both Layer 2 (Ethernet) and Layer 3 (IP) information. A Layer 2 switch will pretty much ignore the IP information, while the router will generally ignore Ethernet MAC addresses, although it will use them to associate a NAT address (see below) with a given PC.

What to look for in a router and switch

Unmanaged Layer 2 switches are fairly homogenous; the only real distinguishing features are the number of

ports available (and therefore the number of PCs or devices that can be connected to them). There are internally distinguishing features, such as the capacity to remember MAC addresses and sometimes the switching speed, but these factors are often unknowable by the end user, and you're never going to see comparative specs. Switches are, by and large, plug-and-play devices. You plug them into the power socket, plug the Ethernet cables in and they do their thing — no user interference required. Modems are likewise fairly homogenous.

Routers are much more complicated. For a small network, speed is typically not a concern, since the low speed of the Internet connection won't require the router to process many messages quickly. But there are a number of features that can differentiate good routers. These include:

• **ADSL2+ support.** A new standard designed to extend the range and speed of ADSL lines. When introduced, ADSL2+ services will be faster than current (ADSL1) services and available to more homes further away from ADSL exchanges. For more details see the broadband feature on page 34.

• **Stateful packet inspecting (SPI) firewall.** All routers will be advertised as having a firewall. In most cases, this is a by-product of network address translation (NAT), which is a system that allows multiple devices to share a single IP address. With NAT, the router acts as a proxy for all the devices on the LAN. It gives out 'private' IP addresses to each of the PCs on the network. NAT makes the PCs on the network effectively invisible (and thus, unreachable) unless they initiate contact with PCs on the Internet. This is the ☺



BROADBAND & VoIP SUPERGUIDE

● **most basic level of security.** However, a router with an SPI firewall does more. Packets are actually read and checked for context before being sent through, providing a greater level of security.

● **Demilitarized zone (DMZ) port.** Some routers allow you to set one (or more) of their physical ports so that they're not protected by the router's firewall. All incoming messages from the Internet are forwarded directly to the PC connected to the port. These ports are useful if you want to run a Web server accessible to the Internet, for instance. (Routers without DMZ ports can also have servers attached, with the host configured in the software, but having a physical port is much more convenient).

● **Virtual private network (VPN).** Routers with virtual private networking capabilities have the capacity to build encrypted 'tunnels' to other VPN routers. This is mostly used to link disparate LANs using the Internet, and allow branch offices to communicate sensitive information online securely.

● **Quality of service (QoS) controls.** Also known as traffic shaping, this allows you to prioritise one type of Internet traffic (say, voice) over another (for instance, Web page downloads).

● **Dynamic domain name services (DDNS) support.** With most consumer ISP accounts, you will get a new IP address every time you log on. This makes associating your local servers with a particular domain name, such as www.myhomepage.com, difficult. DDNS services provide constantly updated domain names as IP addresses change. This allows you to have a domain name, even though your IP address is constantly changing. A router that supports DDNS will communicate with the DDNS service provider and keep the IP address up to date.

● **Content filtering.** The capacity to block undesirable Web addresses and documents containing certain keywords.

● **A good management interface.** Nearly all routers can be managed through a Web interface, and the best ones have good online help systems, accessible controls and readily accessible options.

● The integrated device

If you're building your network from scratch, it's a good idea to look for an ADSL router with an integrated switch. The ADSL router combines the function of an ADSL modem with a router (basically, a router with an ADSL port). The integrated switch provides four or more Ethernet ports on the back of the router

Wireless gateways offer more features than routers (see reviews on page 50 for more details).



If you want the fastest ADSL speeds, make sure you get yourself an ADSL2+ modem.

for you to plug your PCs directly into. For a very small network, these products do it all, although their routing functions are often quite limited. They're not at all expensive, with the cheapest ones costing less than \$150.

A newer set of integrated devices also incorporate wireless access points into the device (sometimes in lieu of the integrated switch). These wireless ADSL routers are typically very simple to set up, providing a complete wireless network in a box — no additional modems, routers, access points or switches required. We've reviewed several of these integrated network products on page 50.

● Expanding the network

Adding more ports to a network is fairly simple. You can cascade switches for a while without any serious performance problems — switches are perfectly capable of associating more than one MAC address with a given port. Plugging switches into other switches is a simple way to increase the number of ports on a network, but it does have limits (which will depend on the switching hardware). The more PCs there are, the more addresses every switch needs to be aware of. You tend to get a lot of broadcasts ('broadcast storms') on large Ethernet networks because the Layer 2 switches cannot keep a record of every PC. Broadcasts are bad for business, tying up a lot of network bandwidth that could be used for more productive efforts. They typically won't be a serious problem until a network grows quite large (far

larger than a typical small business would use).

In addition, adding more than 255 PCs to a single LAN will start to take you beyond the limits of lower-end routers, which are often only designed to deliver IP addresses to a limited number of PCs.

● Gigabit Ethernet

In the past year, we have seen prices on desktop Gigabit Ethernet products drop considerably, and we've also begun to see it become a standard networking protocol on new motherboards. In short, the era of Gigabit Ethernet is nearly here.

So, should you skip right over Fast (100Mbps) Ethernet and go straight for Gigabit? In practice, there's not going to be much difference to most users, but if your network is likely to experience massive file transfers, or is likely to grow beyond a few dozen users, it's worth investigating, if only as a means to future-proof your network.

As we've mentioned, a lot of new PCs now come with Gigabit Ethernet built in. To upgrade older systems by adding in a PCI-based Gigabit Ethernet card is likely to set you back \$40 to \$50 per PC (in comparison, a PCI Fast Ethernet card costs about \$15). Not every system has to be upgraded, since Gigabit Ethernet is backwards compatible with Fast Ethernet.

Upgrading the switches will often incur a bigger cost. At



Harris Technology, for instance, a Linksys eight-port SD208 Fast Ethernet switch cost \$89 at the time of writing. An eight-port Linksys Gigabit Ethernet switch cost \$269.

One possible migration solution, even on small networks, is to use Gigabit as a backbone. If you use multiple switches, for instance, have the Fast Ethernet switches plug into a single Gigabit switch. Company servers (such as file servers) that see a lot of traffic should also be upgraded to Gigabit and plugged directly into the Gigabit switch. The idea is to make sure that all the lines which see high traffic loads be Gigabit. Individual users that need high bandwidth can also be plugged directly into the switch, while everybody else is connected to older Fast Ethernet switches. That way, you can get the benefits of Gigabit without having to upgrade every switch and PC.

Bear in mind that to get

maximum bandwidth, a Gigabit Ethernet network needs to use the newer type of Cat6 RJ45 cabling (as opposed to the Cat5 used for Fast Ethernet).

● Going wireless

Adding wireless to a network is not difficult, although you will need to be particularly cognisant of security issues, since anybody who merely wanders within range has the potential to access your wireless network.

The best way to think of a wireless access point is as a switch without wires. It works on the same principles as a switch and uses a very similar protocol. In short, 802.11a/b/g is essentially Ethernet over the airwaves. A wireless router is a router with an integrated wireless access point (much like one of the routers with integrated switches we mentioned earlier).

Most small businesses will

be looking at 802.11g for their wireless networking needs. It nominally runs at 54Mbps in standard mode and 108Mbps in turbo ('Super G') mode in devices that support it.

One of the key components to look for in wireless appliances is support for WPA (Wi-Fi protected access) security. WPA is more recent and more powerful than WEP (wired-equivalent privacy), and provides a nearly unbreakable means of securing your network — unless the hacker manages to actually get hold of your password.

On most small networks, what you'll be setting up is a pre-shared key (WPA-PSK). This is like a universal password for the wireless network. Every device that wants to connect to the network needs to have that key configured in its drivers.

Larger networks will tend to use RADIUS authentication.

RADIUS servers are used to determine that the person trying to access the network is who they say they are. When a request comes in, a WPA-supporting access point will ask the RADIUS server if that individual should have access to the network.

You can also set up MAC address filtering. Like Ethernet, 802.11 devices have unique MAC addresses, and you can prevent anyone without an authorised MAC from accessing your network. Do not use this as your sole means of security, though. MAC addresses are easy to spoof, and it's also easy to discover which MAC addresses are accepted on the network by scanning for wireless PCs in the vicinity.

On page 74, we have examined a couple of new wireless access points, but again, you should also check out the integrated devices that include wireless connectivity. reviewed on page 50. ●

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Super G access points

D-Link DWL-2100AP

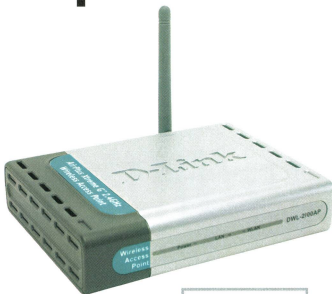
With its simple setup and flexible configuration, the D-Link DWL-2100AP is an inexpensive way to add wireless capability to a network. Its Web-based setup interface will not be too scary for beginners, and a handy wizard walks you through the process of getting it up and running. We were particularly fond of the fact that no CD was required to get it going.

The D-Link supports both Wi-Fi protected access (WPA) and the older and inferior wired-equivalent privacy (WEP) for restricting access to the network. For WPA, it supports both a shared key (that is, a universal password for clients wanting to access the network) and authentication services. It

also has a MAC address filter. Strangely, it defaults to WEP, and turbo mode (108Mbps as opposed to 54Mbps) is also switched off by default; you have to go digging a little to change these settings.

With a little digging, you can also change some quite detailed settings, including the power output if you want to restrict the range of the access point.

It's not a complicated device and might not slot well into a larger enterprise, but for a small business, the D-Link will do everything you need. However, as with the 3Com below, we have some issues with the price. Given that you can get D-Link's wireless ADSL router for around the same price, you'd really be



crazy not to choose this if you're going for an ADSL broadband connection. The wireless ADSL routers do so much more (albeit without the added speed of Super G).

6 Price: \$199
Contact: D-Link
Phone: 1300 766
868 Web: www.dlink.com.au + Easy to set up
+ Good security options
- Too expensive

3Com OfficeConnect Wireless 11a/b/g Access Point

A little more complicated than the D-Link access point, the 3Com OfficeConnect has the advantage of supporting 802.11a in addition to 802.11b and 802.11g. IEEE 802.11a is less common than 802.11g, although they are functionally very similar, and both operate at 54Mbps in normal and 108Mbps in turbo mode. The key difference is the radio spectrum used.

Much like the D-Link, the OfficeConnect has a nice, simple-to-use, Web-based interface, although we'd quibble with a few of the UI decisions. Getting it up and running with WEP or WPA encryption should prove no trouble, though. It supports both a shared key (which is



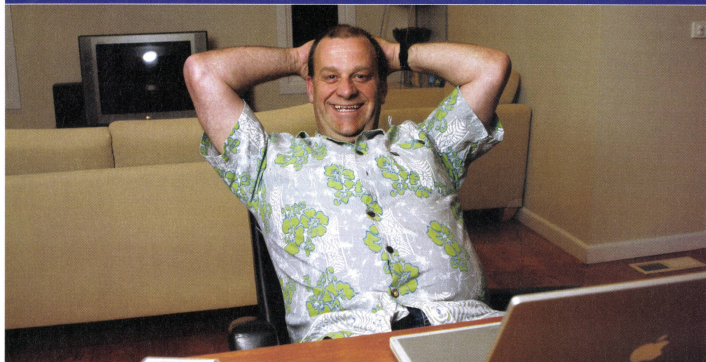
what most small businesses will use) and a RADIUS-based user authentication service.

As with the D-Link, our big criticism is reserved for

the price. At \$249, the cost of the OfficeConnect is very steep, especially considering the 3Com OfficeConnect ADSL Wireless Router can be had for only \$21 more.

6 Price: \$249 Contact: 3Com
Phone: 1800 678 515
Web: www.3com.com
+ Supports 802.11a + Good security settings - Pricey

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Other Broadband Products from NETGEAR

DG834GT 108 Mbps Wireless ADSL Router with 4-port switch and extended range

DG834 ADSL Firewall Router with 4-port switch

DG632 ADSL Modem Router



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PayPal pros and cons

PayPal is a popular choice for adding payments to your site, but there are a few issues you need to consider, Angus Kidman discovers.

While large corporations can afford to pay developers huge sums to create custom online payment systems, most small businesses are forced to rely on third-party solutions. While some Australian banks offer online payment systems for existing customers, the most visible means of adding a payment facility is PayPal.

Much of PayPal's original growth came from payments between in online auctions; indeed, it was so successful in this regard that eBay eventually bought the company. It now has more than 56 million accounts. While auction payments remain a core function, PayPal has also proved a popular choice for many smaller online merchants as a means of accepting payments from customers.

When Australian musicians Deborah Conway and Willy Zyglar decided to sell their latest album, *Summertown*, and some of Conway's earlier recordings directly via the www.deborahconway.com site, one of the first issues they had to consider was how to accept payments. PayPal quickly emerged as the leading contender.

"I think the most obvious reason for using PayPal is its absolute ubiquity on the Internet," Zyglar explains. "Many people I speak to

mistrust paying over the Net, but because they have heard of PayPal they will use it. Brand is all."

Another key advantage of PayPal is the relative ease of incorporating it into an existing operation. "Their system is easy to use and to integrate into your Web site," Zyglar says. (See 'Adding It In' for further details.)

By far the biggest disadvantage is the fact that PayPal is a US-based operation, which means that until recently, all prices have had to be listed in US dollars. "As 70% of our business is in Australia I would

PayPal has been a critical tool for sales of the Conway/Zyglar album *Summertown*.

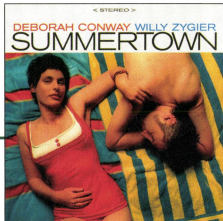
much prefer to run my online business in Australian dollars rather than price our merchandise according to the vagaries of the international currency exchange markets," Zyglar notes. As well as potentially confusing customers, this can also make business planning difficult,

since the price and profitability of sold items can vary quite dramatically.

"I wonder why the Australian banks don't offer a PayPal-type business, as I imagine it could be extremely profitable for them," Zyglar comments. However, there would be at least one drawback to such a system, as he explains: "PayPal is an internationally known business and the 30% of our trade that comes from overseas might be scared off if they had to pay through a local company they hadn't heard of." PayPal has recently introduced the option of charging and accepting payments in Australian dollars for local customers.

A final key consideration for PayPal users are the fees involved. PayPal charges a transaction fee plus a percentage of each sale. For Australian buyers and sellers, these fees are typically 40 cents, plus 3.9% of the purchase price. High-volume merchants are eligible for lower rates. PayPal also charges a \$US1 fee for transferring amounts of less than \$US150 to your bank account.

Overall, Zyglar and Conway have sold thousands of CDs using PayPal (many via their innovative 'Summerware parties', where the pair will turn up and play a short set for any organisation or group of people who order 25 copies of the album via the site). "That would have been extremely difficult to organise without having the ability to take payment over the Internet," Zyglar says.



ADDING IT IN

Once you sign up with PayPal (at www.paypal.com), adding the ability to purchase goods to your site is fairly straightforward. For common features, PayPal offers online wizards that can automatically generate the HTML needed on your site. This code directs customers to the PayPal site to handle the transaction, so the amount of code needed is fairly low. Customising this code is also not too difficult, as this sample demonstrates:

```
<form target="paypal" action="https://www.paypal.com/cgi-bin/webscr"
method="post">
<input type="hidden" name="cmd" value="cart">
<input type="hidden" name="business" value="nora-alice@paypal.com">
<input type="hidden" name="item_name" value="Baseball Hat">
<input type="hidden" name="item_number" value="12345">
<input type="hidden" name="amount" value="15.00">
<table>
<tr>
<td><input type="hidden" name="on0" value="Color?">Color?
<select name="os0">
<option value="Red">Red
<option value="Green">Green
<option value="Blue">Blue</select></td>
</tr>
</table>
<input type="image" src="https://www.paypal.com/images/x-click-but22.gif"
border="0" name="submit" alt="Make payments with PayPal - it's fast,
free and secure!">
<input type="hidden" name="add" value="1">
</form>
```

PayPal offers a handy integration guide (available at https://www.paypal.com/en_US/pdf/integration_guide.pdf), which provides comprehensive coverage of its features.



VoIP and video conferencing

Rose Vines explains how to use the Net to get cheap phone calls.

The other day, the phone rang and it was my friend Flo calling from the US.

We hadn't talked in quite a while, so we nattered on for an hour or so. It wasn't until she said, "Well, this call has cost me \$1.20," that I realised she was 'Skyping' me — calling me from her computer using Internet telephone software. On her end, no phone was involved at all, merely a headset microphone, Skype software, her computer and her broadband Internet connection. From my end, it seemed like a normal phone call. Maybe with a touch more echo on the line than usual, but otherwise indistinguishable from a call from across town.

This is VoIP in action. It's a technology that has been lurking around for some time, appearing in nascent form in a number of applications over the years. Now, it's starting to make a splash.

What is VoIP?

VoIP, also known as Internet telephony, is a phone system that runs on the Internet instead of the traditional public switched telephone network, or PSTN.

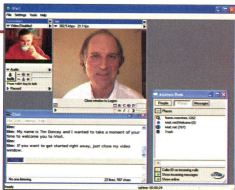
The rather strange acronym stands for Voice over Internet Protocol. The 'voice' part of that

is easy enough to understand; the 'Internet Protocol' part refers to a method used for packaging and addressing data on a network.

The Internet itself is an example of a packet-switching network. Information is passed around in packets known as 'datagrams'. When you send any form of data across the Internet, the data is first chopped up into chunks. Each chunk contains part of the original data, as well as a packet number indicating where it fits in the stream of data packets created from the original, plus the destination address. Your computer sends the packets to a nearby router; the router checks the address and passes each packet to another router, and so on until the packet reaches the appropriate address. Packets are routed along the least congested paths, so not all packets will follow the same route to their destination. Once all the packets arrive at the destination, they are reassembled, using the packet numbers, into a whole again.

Contrast this with the public telephone system, which is a circuit-switching network. When you want to transmit information between two points, you establish a connection between those points and maintain that two-way connection for the duration of the call. So, when you pick up the phone, you first listen for a dial tone indicating a connection to your local telephone company. You then dial the number, your call is passed through the local switch and possibly through a number of intervening switches to its destination, where the phone rings. When the person you called answers, a circuit is created, remaining open until one of you hangs up. The direct

When words are not enough, try video phone calls using iVista.



link between the two parties involved makes it a very reliable form of communication.

The downside to circuit switching is that it's not very efficient. It requires a dedicated, if temporary, channel between those communicating, and its wasteful of that resource: much of a phone call consists of silence on the part of at least one of the parties involved, and there are times when no-one is talking. While packet switching may not have the same simplicity and reliability, it is far more efficient because it eliminates all the 'silences' on the network and transmits only when data is present. And there's no need for a dedicated circuit; due to the addressing scheme built into the data packets, your packets can be intermingled in a stream of packets from many other users, with each finding its way to the correct destination.

PC-to-PC VoIP

VoIP comes in a variety of flavours, from simple software applications to complete phone replacement solutions.

At the low end of the spectrum are PC-to-PC voice

applications. These apps let you chat with fellow computer users who are running the same software. Most instant messaging programs, including AOL Instant Messenger and Windows/MSN Messenger, provide a voice feature like this. There are numerous VoIP applications that do the same thing, including the popular Skype (www.skype.com) and Firefly (www.freshtel.net/firefly).

To use these applications, you and the people you wish to call need the same instant messaging or VoIP program installed, a mic and speakers and, of course, an Internet connection. The calls are mostly free, apart from what you pay for your Internet line.

TOP TIP Bandwidth usage

If you pay per megabyte for your Internet connection, it's handy to know how much your voice calls will consume. Both Firefly and Skype use around 3KB per second in a one-to-one call. That's around 10 megabytes per hour.

ON THE COVER DISCS

You'll find a range of instant messaging utilities and VoIP softphones on this month's cover discs.



BROADBAND & VoIP SUPERGUIDE

While calls are possible on a dialup connection, audio data consumes a lot of bandwidth, so the faster your connection, the better the audio quality and the less likely it is that bits of the conversation will drop out. You'll get the best results if both you and the person you're conversing with have high-speed connections.

You can also improve the quality of the calls by using a headset mic. If you intend to use VoIP, then a quality headset/mic combo is worthwhile, preferably with a USB connection to your computer.

Softphones

The next level of sophistication are programs that let you make calls not only from PC to PC, but also from PC to phone. These are often called 'softphones'. Skype and Firefly are examples, as is the venerable Net2Phone (<http://web.net2phone.com/consumer/center>).

With a softphone, you can place PC-to-PC calls for free to anyone using the same softphone; you can also call regular landline or mobile telephones for a per-minute charge. That charge is usually much, much lower than the rate you get when making traditional phone-to-phone calls, often just a few cents a minute for calls to the UK and the US.

Why so cheap? Because a long-distance softphone call travels most of the way along the Internet, carried along with all the other data on the network. It only jumps off the Net and onto the traditional phone network when it hits a gateway near the phone number you dialed. From that point on, the call travels over the traditional phone network, and you get charged for that short segment of the call. Most softphone providers get you to prepay for calls using a credit card; you can then speak all you like until you've used up your available minutes, when a recharge is required.

The quality of softphone

A headset mic is the only peripheral you need for VoIP.

calls is dependant on the speed of your Internet connection, the type of mic used, and the compression technology used by the softphone. If you have a high-speed Internet connection and a good headset mic, call quality should be quite acceptable for most uses, although you may notice a little more line noise and echo than with traditional phone calls. You can also improve the quality by buying a USB phone, such as the one offered by Freshtel for its Firefly service. Such phones also integrate neatly with the softphone itself, giving you an automatic dialling directory.

Most softphones provide better voice quality than traditional instant messaging programs with a voice feature because they use sophisticated compression algorithms. The software first compresses the voice data before sending and then decompresses it at the receiving end. The result is not always perfect. In practice, I've found softphones are fine for calling siblings and colleagues, but just not good enough for calling my hard-of-hearing, octogenarian mother.

Some softphones provide additional features, such as multiple-party phone calls and voicemail, which make them even more attractive.

Broadband phones

Phone-to-phone VoIP takes your computer out of the equation and lets you use your regular phone to place calls across the Internet. To do this, you need:

- A VoIP service provider.



TOP TIP

VoIP and firewalls

You may have to fiddle with your firewall settings to get your softphone to work. For instance, Firefly requires port 4569 to be opened in some environments. Skype seems to work pretty well with most firewalls. If you encounter a problem, check out the detailed instructions at www.skype.com/help/guides/firewall.html.

- A high-speed Internet connection and modem.
- A digital phone adaptor to convert the analog signals from your phone into digital. The adaptor plugs in between your regular phone handset and the cable or DSL modem. To use your computer online, in most cases, you also plug your PC's network cable into the digital adaptor, so you can use both the VoIP phone and PC simultaneously.

Broadband phones provide the best quality of all VoIP alternatives. In the US, where VoIP has a head-start on us, companies such as Vonage (www.vonage.com) have encouraged hundreds of thousands of customers to abandon their phone lines altogether. Broadband phone services often provide a smorgasbord of features, many included with the monthly service charge. Engin (www.engin.com.au), for example, offers three-way calling, voicemail, V-mail (email notification of voice messages), address screening, scheduled redirection and much more.

There are pitfalls to dumping your traditional phone service, though. Your broadband phone is dependant on your Internet connection; if the Net goes down, so does your phone. If you're not satisfied with your high-speed Internet service, avoid relying on it for your phone service. You may need to have multiple handsets around your house and abandon your old phone number. You also won't have a White Pages listing, and your Internet phone may become a potential target for virus writers and voicemail spammers.

Video phones

Well over 10 years ago, a company delivered a pair of video phones to the PC User offices so we could check out this 'up and coming' technology. There's no doubt they were cool; they were also very expensive at around \$2,000 a pop, and the quality of the video left a lot to be desired. Our assessment was that they were nowhere near ready for prime time.

Jump forward over a decade and video phones are still stuck in the 'up and coming' basket. That's because while audio consumes a lot of bandwidth, video consumes far more and it requires new hardware on both ends. It also looks like mobile phones may have stolen this sector of the market for themselves, leaving traditional landline phones and PC-based phones out in the cold.

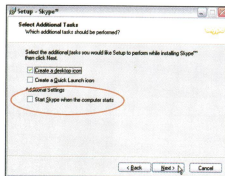
Videoconferencing apps have been available for many years, allowing you make PC-to-PC video calls. CUSeeMe was one of the best-known of these. The company was sold some time ago, but the author of CUSeeMe, Tim Dorey, has a new videoconferencing app that does an even better job. iVisit (www.ivisit.com) gives you PC-to-PC voice and video calls, multi-person videoconferencing, file sharing and Web co-browsing.

To use iVisit, you need a Webcam, an Internet connection (as fast as possible), mic and speakers, and an iVisit account. A Lite account is free and gives you one-to-one, 60-minute video calls at 160 by 120 resolution; PC-to-PC audio calls; instant messaging and chat; limited file sharing; and the ability to do remote presentations. For \$US39.95 per year, you can upgrade to iVisit Plus and get high-quality video and audio conferencing; high-priority bandwidth and high-res video; and unlimited file sharing. There are also options for businesses and educational institutions.

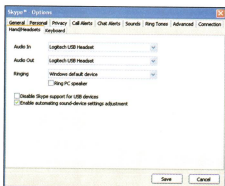
For larger businesses, companies such as WebEx (www.webex.com) offer advanced voice conferencing for around \$500 per month and up. ☺



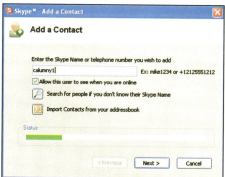
STEP BY STEP HOW TO SKYPE



1 Skype is one of the most popular softphones. To get started, download and install the free software from this month's cover discs. Note that Skype uses peer-to-peer technology, grabbing idle cycles from your computer's processor to route calls by other Skype users. It doesn't appear to cause a noticeable drain, but if you primarily use Skype for outgoing calls, remove the tick beside 'Start Skype when the computer starts' and, when you're not using the program, right-click its icon in the taskbar and select Quit.

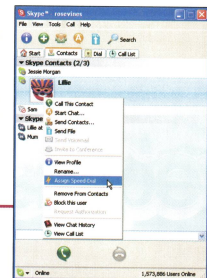
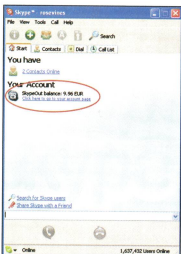


2 The first time you use Skype, you'll be prompted to choose a Skype name and password. You should also set up the program to work with your preferred telephone. Click File → Options → Hand/Headsets and select your device from the drop-down lists.

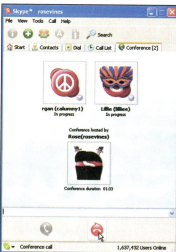


3 To add a contact for PC-to-PC calls, you'll need to know their Skype name. Alternatively, you can perform a search for them using the Skype directory, but if they haven't provided details about themselves, you won't have much luck. A quick email to them asking for their Skype name may be in order.

4 Once you've added a contact, making a phone call is as easy as double-clicking their name on the contacts tab. For more options, right-click the name.



5 If you want to make PC-to-phone calls, you'll need to set up a Skype Out account and prepay for calls using a credit card. On the Start tab, click the link to go to your account page and then follow the prompts to fund your Skype Out account. When you add a new phone contact, type in the phone number preceded by a plus sign and the country code (for Australia, that's +61) and omit the 0 for area codes. For example: +61 (2) 9555-5555. A number in the US might look like this: +1 (504) 123-4567.



6 Want to talk with more than one person at once? Use a tele-conference. On the Contacts tab, click the first contact you want to call, and then hold down the Ctrl key while clicking all other contacts to be invited. Then, click the 'Invite selected contacts to a conference call' button and wait while each participant answers the phone.



Setting up VoIP

If you have broadband Internet in your home or office, you can easily make cheap phone calls over the Internet. Paul Zucker explains how.

TOP TIP

eBay

Looking for VoIP hardware to play with? Look no further than eBay (www.ebay.com.au). Search for terms such as **VoIP phone** or **VoIP ATA**. You will find some vendors who are able to provide advice and technical support.

This Sipura ATA is provided with the engin VoIP service.



The practice of using the Internet to make phone calls is not a new one, but only recently has Voice over IP (VoIP) become simple enough for it to become a viable option for home and small business users. A growing number of Voice over IP Service Providers (VSPs) are entering the market and this competition is ensuring lower prices and more options for consumers.

Getting started with VoIP

So what do you need to get started with VoIP? The best thing about a standalone VoIP system is that you don't need to connect through a computer to use it. Standalone systems are based around a black box called an Analog Telephone Adaptor (ATA). Put simply, an ATA is a device that connects a standard telephone to a VSP via the Internet, without any need for a computer.

Take the Sipura ATA provided with engin's VoIP service (pictured above). It is a box that looks similar to a smallish modem at around 10cm to a side, and 3cm high. It has a socket for a standard network cable, a 5V external plug pack and corresponding power socket, a couple of status/activity lights and two standard modular telephone sockets. That's right — two phone sockets. This is because it can support two completely separate phone services.

Inside the ATA is a processor that uses a codec to digitise and compress the voice going out, and decompress the voice coming back, turning it back into sound.

Plug the ATA into an Internet-connected network socket (such as a port on a LAN switch or router) and power it up, and it immediately attempts to contact the VSP. Assuming that you have a registered account, as soon as it has established a connection, you'll hear a dial tone on the phone you have connected. If someone dials your VoIP phone number, your phone rings. Likewise, you can ring out.

The main problem with a VoIP system is that it is entirely dependant on your Internet connection. If the Internet connection goes down, so does the phone. Once the Internet connection is re-established, the ATA also re-establishes a connection within seconds.

How does it work?

To make a phone call using VoIP, you have to connect to the other person's phone (whether that be another VoIP phone, a mobile phone or a standard PSTN phone). This is normally done via the various phone carriers around the world. The calls patch through almost instantly, and one party or the other is billed for it.

A VoIP call to a non-VoIP phone uses both the Internet

and the standard phone system. Using your VSP, your voice travels via the Internet to a point close to your destination. From there, it hops onto the standard telephone system and on to your recipient's standard telephone.

For instance, let's say your VSP is based in Sydney, you're in Melbourne, and you want to call someone in Ireland. You pick up your VoIP phone, hear a dial tone, and dial the number in Ireland, just as you would using a regular phone. The VSP server in Sydney works out who you want to call, and connects you to the gateway that's nearest to the destination. Depending on the VSP and its partners, this may be in Ireland, London, Hong Kong or in Sydney. Or just about anywhere else — theoretically, you don't care because the cost doesn't change.

Your call is forwarded to the appropriate gateway via the Internet, and then connected to the standard (PSTN) phone system. Obviously, if you're calling Dublin, the most efficient place to have the gateway is in Dublin, so the VSP only has to pay for a local call.

But remember that you're paying a fixed price for the call. Let's say it's 10 cents per minute. If the VSP can do it for less, then that's how it makes its profit. The same thing applies with calls to capital cities around Australia — depending

on your VSP, they may be a flat 10 cents, untimed, simply because there's a gateway in each city.

Of course, if you want to call someone who also has a VoIP phone — especially someone using the same VSP — then there's no need to go via the PSTN at all. The VSP or VSPs can route the call exclusively through the Net, without incurring any PSTN charges at all.

So aren't the calls free, then?

VoIP calls made exclusively over the Internet aren't free any more than email is free. It still costs money to set up and maintain the infrastructure to connect people together via the Internet. The difference is that

TOP TIP

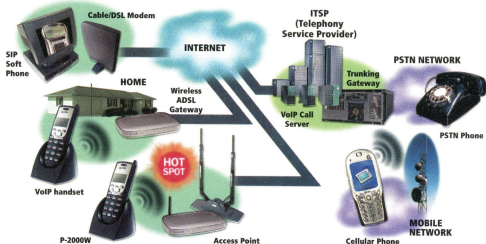
Roll your own

If you have a yearning to experiment in VoIP, and aren't afraid of a few dead ends, there are all sorts of things you can do with the help of the Internet.

- Trawl for discussion groups, especially those in Australia.
- Learn to reprogram an ATA. Most can be flashed to work with other service providers.
- Learn about SIP — Session Initiation Protocol.
- Go to the NetComm Web site www.netcomm.com.au which has a useful Australian VoIP resource section.



HOW VOIP WORKS



you're paying for the access, not the call. If you had an Internet account that charged only by the kilobyte of data carried, and you only used the connection to talk to someone via VoIP, then the ISP charge for the month would be the cost of your phone calls.

● How much bandwidth does it use?

The amount of bandwidth used in hardware VoIP solutions is relatively small — typically, around 8 kilobits per second (Kbps). That is, you could theoretically conduct a couple of VoIP calls, even on a dialup connection. And you can certainly fit multiple simultaneous VoIP calls on a broadband connection. For instance, a 512/128Kbps ADSL connection would theoretically carry 16 calls.

Of course, that's in theory. Unfortunately, VoIP calls aren't like other uses of the Internet, such as downloading a file or viewing a Web page, although they're treated as though they are. Because the call is happening in real time and you need continuous, uninterrupted communications, you can't afford bottlenecks in the system, such as someone else hogging all the bandwidth. However, in practice, you should be able to use a couple of VoIP phones all the time under most conditions. (Most VSPs suggest that you

suspend bandwidth-hungry applications if you experience problems during VoIP calls.)

Professional VoIP systems such as those available from Avaya (www.avaya.com.au) are designed to go into commercial situations such as office buildings. The last thing you would want on a phone call to a company is to have the call interrupted with dropouts or delays, so commercial VoIP systems have an added function called QoS (Quality of Service). This is simply a way of prioritising data traffic, so that VoIP calls get precedence over non-time-sensitive applications such as transferring files. QoS will be built into the next generation of ATA boxes for home and small office VoIP.

● Delay

Normal wired telephone calls travel at around the speed of light. That is, a call around the Earth via undersea cable will have a delay that's almost imperceptible, while calls that go via satellite will have a delay that's considerably less than a second, although noticeable. However, VoIP calls not only have to make the same sort of trip, but because they are packetised and sent over the Internet, the chance is that the delay will be longer. If you've ever used a cheap International phone calling card and marvelled at how bad the call was, that's because it's done over a very poor VoIP link. A call through a commercial VSP such as Engin will be much,

much better.

● Quality

The subjective quality of a VoIP call is a combination of:

- Audio bandwidth. You want it to be clear and natural, not

TECH TERMS

PSYN (Public Switched Telephone Network). Also called POTS or Plain Old Telephone System. This is the standard phone system used around the world, consisting of thousands of interconnected national and local telephone companies.

QoS (Quality of Service). A technique that can be used to give specific Internet applications (like VoIP calls) a higher priority on a network. For example, if another application attempts to transfer a large file, the VoIP call will get all the bandwidth it needs first.

Sidetone. This is the amount of your own voice that you hear in the earpiece of your own phone. You may not realise it, but this is psychologically very important for comfortably phone use. It helps prevent you from shouting into the phone, and subconsciously assures you that the phone is working. On a VoIP or any long-distance call, it is essential that you only hear yourself this way, and not coming back as an echo from the other end.

VSP (VoIP Service Provider). A company that provides you with a VoIP telephone service that interfaces to the PSYN.

WHAT ARE THE PROBLEMS?

You don't get anything for nothing, says the old adage. So what are the problems with ATA VoIP? **Power.** A PSYN phone is powered by the telephone exchange, which in turn is backed up by batteries. When you have a local blackout, your standard Telstra phone will still work. However, because the ATA depends on local power to operate, it will fail when there's a blackout — but then again so will your cordless phone on a Telstra line. You could have a power backup system, but is it worth the fuss? Most people will use a mobile phone in these conditions.

Reliability. A VoIP phone won't be as reliable as a PSYN phone. There are more things to go wrong, such as the Internet service failing, someone

disconnecting a lead somewhere in the house, unusually high Internet traffic loads and so on.

000 calls. There are a couple of serious problems with making emergency calls from a VoIP service. The first is that there is a chance that the VoIP dial tone simply won't be there when you pick up the handset to dial 000. And this is no time to be troubleshooting your network or rebooting the ATA box. The second problem is that the 000 people will only have your registered billing address on their screen. If you've relocated the service, then the ambulance or fire engine will turn up at the wrong house. Always give your local address if you have to make a 000 call from a VoIP phone.



BROADBAND & VoIP SUPERGUIDE

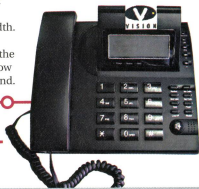
☛ sounding like yelling down a storm drain or garden hose.

● Delay and sidetone. No audible echo and no feeling that you have to say "over", as if on a walkie talkie.

● Dropouts. No loss of the call, even for a single syllable of the conversation. And certainly, not that stupid feeling you get when you realise that you've been talking to yourself for the last 30 seconds because the call has dropped out.

In practice, a VoIP call using the current service providers will probably seem almost as good as a normal Telstra call between two fixed phones. However, the call could be better than phone quality, if you and the VSP are willing to pay for the extra bandwidth. Anyone who has an Optus phone that's connected via the Optus TV cable will know how good a VoIP service can sound.

This is an example of a VoIP handset.



What can you connect?

You can connect anything to an ATA that you can legally connect to a standard Telstra line. Probably more, because you aren't as constrained by the Australian Communications Authority (ACA) rules (see www.aca.gov.au for more details). For example, you can connect normal wired telephones, cordless phones or even a telephone headset with a numeric dial pad.

A fax machine should work on VoIP depending on the service, although it may be at a lower speed. Some VSPs offer a dedicated fax service. ☺

FUTURE PRODUCTS

There are already a few VSPs operating in Australia. These and future entrants in the field will add new services in order to attract new customers. These are some new products and services we can expect to see.

- There are already phones with ATAs built in. You simply plug the phone into a LAN port.
- Cordless phones that contain their own ATA and work on Wi-Fi wireless networking. Theoretically, you could even take your phone to a Wi-Fi-enabled café and use it there.
- Devices that use VoIP when available, but will revert to the standard Telstra line otherwise.
- VoIP videophones. These will primarily work with other like equipment at the other end.
- VoIP security and monitoring boxes. For instance, you may have a silent call mode so you can call your VoIP number, but instead of the phone ringing, you will hear what's happening in the house via one or more microphones. (Scary?)
- Multi-line ATAs. Although you may only have a single VoIP phone number allocated by your VSP, there's no reason why the VSP shouldn't allow you to make multiple, simultaneous outgoing calls. This is great for large families.
- PABX. Just as you can buy a PABX (Private Automatic Branch Exchange) telephone system for an office, you could have a VoIP-based PABX system for the home or small business. In future, it will be common to wire the network throughout the house, so why not put a VoIP phone in every room, connected to the network? You could take or make calls on any phone, make calls within the house, transfer calls and so on. Wi-Fi phones would also be a part of this 'network'.

JUST WHAT IS BANDWIDTH?

For the first hundred years or so, telephones were fairly simple devices. When they were introduced in the latter part of the 19th century, they consisted of a microphone and an earpiece at each end, connected by a pair of wires.

This might sound a lot like today's phone system, but there's a huge difference. In the early days, the voice quality of the phone call was limited by a number of factors — such as the quality of the microphone and earpiece — although not the line itself. Theoretically, we could have had phone calls with hi-fi quality.

However, long-distance circuits demanded better use of these two wires, so a technology known as multiplexing was introduced, which squeezed multiple calls into the space of one. For many years, most circuits other than those between you and the telephone exchange have been digital. That means that the analog voice signal is compressed and digitised, so that it occupies the minimum bandwidth.

However, when you're dealing with phone calls, there are actually two types of bandwidth you need to consider.

'Audio bandwidth' is the range of audio frequencies that are carried on the phone equipment. To give you an idea of audio bandwidth, most people can hear up to around 20kHz (or 20,000 cycles per second). A CD can reproduce up to around 20kHz and an MP3 file is typically around 10 to 20kHz, depending on the sample rate. For a long time now it's been considered appropriate that a telephone call have a bandwidth ranging from 300 to 3,000Hz (or only 300 to 3,000 cycles per second).

To put that in musical terms, a CD would be able to reproduce a couple of octaves above and a few octaves below a phone call. The reason is simple: that's all the audio bandwidth you need to intelligibly convey human speech. Anything outside these limits

would be wasted. It also explains why music heard over a telephone line is of limited quality.

There's another type of bandwidth involved, though. In order to understand how a phone audio signal is carried as a digital (data) stream, we need to talk about the communications, or data bandwidth. A typical dialup connection has a bandwidth of around 40 to 56Kbps. There's a rule of thumb which says that when you digitise an audio signal, such as a telephone call, you need three times the audio bandwidth in data. So, a 3kHz audio bandwidth needs around 9Kbps of data.

Of course, if you are carrying a stereo pair of signals, you'll need double the data bandwidth because there are two audio channels. And don't forget that a telephone call is duplex; that is, it has simultaneous data being carried in both directions.

You've probably guessed by now that today's mobile phones send voices digitally. What you may not know is that a number of phones share a single channel, and the system rapidly switches between them. They each get a short time to receive and transmit data. That explains the annoying buzz you get when mobile phones are near audio equipment — it's the frequency at which the phones on a cell are polled.

Not only are mobile phones digital, but other circuitry and signal processing is used to further compress the signal, to get as many phones on each phone tower as possible. This processing is able to remove unnecessary parts of the audio such as silence. The process uses a codec (or compressor/decompressor) to compress the data.

And exactly the same thing happens in VoIP. A codec is used to make the best use of the available data bandwidth.

Ditching MP3

Next-generation compression codecs are finding support in hardware devices. Darren Yates shows you how to use them.

The lossless audio formats we looked at last month are slowly gaining support from hardware manufacturers, but there are other lossy formats that are also well worth trying.

Ogg Vorbis, WavPack and even Microsoft's Windows Media Audio (WMA) now offer better audio quality at smaller bit rates than MP3. In addition, most new DVD players now support WMA and MP3 playback on CD-R media.

While many don't agree with the digital rights management (DRM) stance taken by Microsoft with WMA, DRM doesn't have to affect your enjoyment of your music. The good thing about WMA (even version 8) is that it can produce quality with a bit rate of 96Kbps that MP3 can't do with 128Kbps. DVD players that support WMA don't have a problem with DRM, happily playing whatever they find on a disc that is compatible.

The trick is to never use WMA as your initial file source, as audio encoded to WMA with DRM enabled requires software keys to play and/or unlock. However, you can avoid this problem by making sure you have audio in another format, and then copying it to WMA format with no DRM enabled.

WMA is by no means open source, but that hasn't stopped CD rippers and encoders from appearing online that support

WMA: both Audiograbber and CDex support this format.

Ogg Vorbis is another format gaining ground among hardware vendors and is appearing in some portable media players. Ogg Vorbis is open source and royalty-free, so it's mostly gaining underground support. Another thing: Vorbis is the audio codec, Ogg is the file 'container'. It's a bit like saying 'AVI DivX' — DivX is the codec, but AVI is the file format that usually holds it together.

Ogg Vorbis is built into the freeform open-source audio editor Audacity, as well as Audiograbber, so there are a number of good tools using it.

Vorbis is similar to WMA in its ability to provide quality versus bit rate, although few standalone DVD players support it at the moment.

Another option is AAC (Advanced Audio Coding), the format used by Apple and its

ON THE COVER DISCS
You'll find Audiograbber and CDex on this month's cover discs.

iPod downloadable music. AAC is being seen as the next big thing to hit commercial audio, but there are licences and fees all over the place.

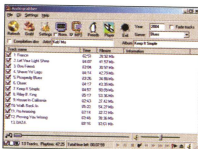
Which is best?

Lossy compression is all about what you can get away with: how high can you compress a file and still get away with half-decent sound quality?

For PCs, a lossless compression format is the best option. The same goes for hard disk or DVD-based hardware streamers/players. But for portable devices, WMA or Ogg Vorbis would be the way to go. In other words, choose the codec based on the device's storage capacity.

The important thing is you don't just have to settle for MP3, as there are plenty of other options, lossless or otherwise, that are well worth considering.

STEP BY STEP RIP YOUR AUDIO CDS TO OGG VORBIS



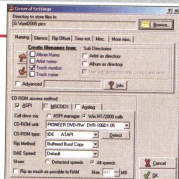
1 Fire up Audiograbber and load in the audio CD you wish to rip. If you have Audiograbber set up correctly, it should automatically retrieve album title and track info from the freedb database. Click the Refresh icon if you need to.



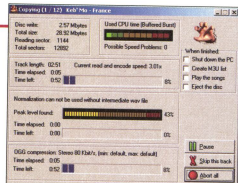
2 Click on the MP3 G-clamp icon to bring up the MP3 settings. Check 'Direct Rip and Encode to MP3 file' in the 'Grab to:' box and, in the 'Internal Encoder' tab, click the drop-down and choose 'Ogg Vorbis'. Select the Stereo and 'Managed

bitrate' radio boxes. Finally, in the 'Nominal Bitrate' drop-down list, select '96 Kbits/s' and click OK.

3 At the main screen, click the Settings icon and then the Browse command button. Select the drive and folder in which to store your ripped Ogg files.



4 When you back out to the main screen, click on the Grab icon and Audiograbber will start ripping your CD straight to Ogg Vorbis format. Play back the files using the latest version of Winamp.



Make a bootable JPEG-viewer CD

In the final part of his bootable CD series, **Darren Yates shows how you can easily view your favourite photos on any PC.**

How many times have you wanted to send photos of the kids to the relatives overseas, but didn't want to clog up their email account? You also need to ensure that they can actually view them.

In this tutorial, we show you how to create a bootable CD that does the trick. Our method uses a tiny freeware application written by Stefan Peichl called LxPic (<http://hplx.pgdn.de/>) and, by combining it with our FreeDOS bootable CD concept (for more details see *PC User* February, page 101 and March, page 68), you create a bootable CD that automatically begins displaying all of the JPEG photos you load onto a recordable CD. It displays images in a full-screen, keyboard-controlled slideshow. It works on just about all PCs, even ones without a hard drive!

What you need

LxPic was written to work on an 8088 computer — yep, the very

first IBM computer — with as little as 64KB of memory and a CGA graphics card and monitor.

For our purposes, any PC or notebook that can boot from a CD-ROM drive will do just fine. Again, you don't need a hard drive, and if one is present, our JPEG-viewer CD won't even access it at all.

For the record, here are the minimum requirements we suggest you work with:

- Intel 80286 processor or better
- 640KB of memory
- 8x CD-ROM drive
- VGA graphics card and monitor
- Keyboard
- A system that is capable of booting from a CD-ROM drive.

How it works

Just like our MP3-player CD, we've developed a tiny FreeDOS distribution that takes up less than 200KB of space and coupled it with LxPic, which only uses 20KB itself. We've built this into a 1.44MB ISO image that you need to burn onto a recordable CD using either Nero or the freeware CDBurnerXP Pro burning tool (you'll find the latter on this month's cover discs). Next, load your JPEG images into the main partition of the CD (it can contain up to 700MB) and then burn the disc.

To be honest, I'm almost embarrassed that the ISO image is as big as it is, but unfortunately, 1.44MB is as small a bootable partition as you can make. In reality, the whole thing could fit on a 360KB floppy disc.

When the disc first boots up, it becomes your A: drive and, if you have one, it will overtake your floppy drive's position until you reboot. It then loads the FreeDOS SHSUCDX CD-ROM

mounter and loads the second partition on your CD as drive J:.

LxPic then fires up and searches for the best standard-resolution graphics mode it can find; for most PCs, this will typically be 640 by 480 pixels at 16-bit colour depth. It then searches the J: drive for any supported image files and displays the first one it finds in the root directory. If you need to change the drive letter to something else, use the same techniques as we showed in our February story (page 101).

Using LxPic

The 640 by 480-pixel/16-bit colour screen default option LxPic starts with is probably fine for older PCs, but you can easily change this for more modern systems. LxPic supports any resolution from CGA (320 by 200) right up to QXGA (2,048 by 1,536), provided that your monitor can go that high.

While LxPic is running, simply hit the (*) key (press Shift-8) and a list of screen types your card supports will appear centre-top. Use the up and down arrow keys to move through the list to a higher resolution option (for example, 1,024 by 768-pixel/32-bit colour) and hit Enter on your keyboard. LxPic will automatically reset the screen to the new resolution and redisplay the previous image. You can change this setting at any time.

If you accidentally go too far and pick a resolution setting not supported by your monitor, simply press Esc and you'll be dumped back to the DOS prompt. Type `autoexec.bat` and LxPic will start up again. Or, just press the Reset button.

Using LxPic is pretty simple, just remember, to view the next image, press the spacebar; to

ON THE COVER DISCS

On this month's cover discs, you'll find the **PC User JPEG View ISO image**, plus the free burning program **CDBurnerXP Pro**.

view the previous picture, press Backspace. It doesn't get much simpler than that.

LxPic actually supports BMP, GIF and PCX images in addition to JPEG images. When you consider that the program is just 20KB, that's absolutely brilliant.

And just as with our MP3-player CD, you can load this JPEG-viewer CD back into your Windows PC and you'll see only the partition containing your images, not the bootable partition. So it works as the perfect storage option, too.

General tips

If you're ready to load up as many images as you can on the CD, try converting them to 640 by 480-pixel/24-bit colour JPEGs beforehand. At a rate of 70KB for each JPEG photo, you'd have room for 10,000 images on one CD.

If you don't have quite that many to install on a disc, try converting your pics to 1,024 by 768 or 1,280 by 1,024-pixel resolution for better quality.

However, the simplest option is to just dump your JPEG images on the disc as they are. LxPic can resize images of virtually any size on the fly, so the whole image fills the screen. That means if you've taken JPEG snaps with your 4MP digital camera, just dump them on the CD and LxPic will play them back without a hitch.

Cartoon note

Another of this little program's features that I love is its video

TOP TIP

Use CD-R discs

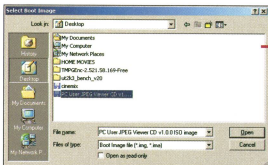
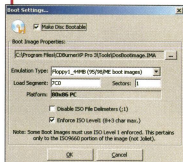
If you're using CD-RW discs to save money, remember that older CD-ROM drives (particularly those slower than 8x) have trouble reading CD-RW discs, so make sure you use CD-R discs for your final burn.

STEP BY STEP MAKE YOUR OWN JPEG-VIEWER CD

1 Download the **PC User JPEG View** ISO Image file from the cover discs to your Windows desktop and then load in a blank CD-R disc into your CD or DVD burner. Install CDBurnerXP Pro if you haven't already done so, and fire it up. Select the 'Data/DVD' option.

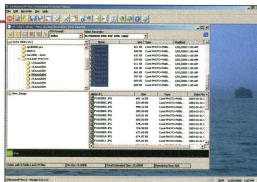


2 From the top menu, select **Disc** → **Boot Options** and, in the 'Boot Settings' window, check the 'Make Disc Bootable' option.

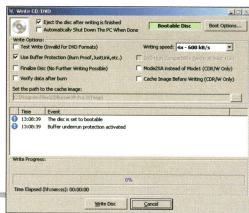


3 In the 'Boot Image Properties' box, click on the file selection box (labelled '...') and choose the image file you downloaded from the cover discs. Make sure the Emulation Type reads 'Floppy 1.44MB' and click OK.

4 Using CDBurnerXP Pro's Explorer, load in your image files into the root folder of the 'New Image' window (the main disc partition).



5 Once you've added all your images or filled up the disc to its 700MB limit, click the Burn button at the top and then the 'Write Disc' command button on the next screen. After the burn is completed, set your PC to boot from the CD drive, reboot and you should begin seeing your photos appear on the screen.



play mode.

Remember at school when you used to draw cartoons in the page corners of your diary, and then flick through them quickly to create animation? LxPic can do that with individual image files.

Simply line up all of your GIF images in the root folder in numeric order — for example, PIC0001.GIF, PIC0002.GIF and so on — then go to the A: drive DOS prompt and type **lxic j:*.GIF /v**, and watch what happens. You may need a faster PC in order to see it at true video speed, but it's a fun tool you can use if you're

good at drawing cartoons.

Final words

While I'm ending this series here, it's certainly not the end of the list of uses for a bootable CD. In fact, I'll be using it again in a more specialised role in an upcoming Hardware column.

From a PC perspective, the El Torito boot system for CDs is one of the most underutilised aspects of this media. And with floppy discs taking a dive, CDs are quickly becoming the new floppy replacement.

Audio, video and still images are three applications

we've looked at over the last three months, but think about others that can also work: a bootable CD that runs all those old DOS games, for example.

In this role, you can turn your old computer hardware into a glorified Atari 2600 clone or PS2 — the hardware simply runs the code direct from the CD.

At the very worst, all three tutorials plus a DOS games CD combined could give you the world's cheapest media centre PC, costing you the price of four CD-R discs.

Unfortunately, the various flavours of Windows have

dulled our senses into believing a program has to be big for it to be good. But over the last couple of months, we've shown you how to make the ultimate jukebox MP3-player disc, a powerful Linux-based DivX/XviD movie player, and now an easy-to-use image viewer. All use freeware and require neither an operating system nor a hard drive on the PC you wish to play them on.

Hopefully, you now know there's far more to the humble 20-cent CD-R than meets the eye, and that not every application requires the latest whiz-bang PC hardware. ☺

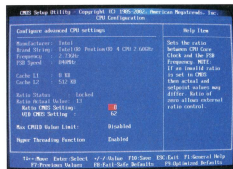
Advanced BIOS settings

Darren Yates continues his in-depth look at the motherboard BIOS and how to make use of it.

When you purchase a motherboard, the way the manufacturer has set the BIOS/CMOS setup can determine not only how fast your PC runs, but which features are turned on and, importantly, how stable your system will be. That's why it's becoming vital that you learn and understand just what the BIOS/CMOS setup does, and how to make the most of it.

Before we get going, it's important to remember that changing settings within the BIOS/CMOS setup without knowing what you're doing can cause your PC to stop working. As such, *PC User* offers no warranty for any changes you make to your BIOS/CMOS setup — you make these changes at your own risk. With that out of the way, let's look at the advanced settings options.

Our example Shuttle PC has all of the advanced settings options located on the one page. As you can see, there are 10 sub-pages that deal with specific settings for the CPU, hard disk, floppy drive, peripheral ports, status checks, power management, USB,



Hyper-Threading can be switched on or off in the CPU configuration screen.

overclocking and specialty peripherals. Let's start with the CPU settings.

The first half of the advanced CPU settings here basically tell you how the processor is operating. You get details on the manufacturer and the chip type from the 'brand string'. Notice that it won't indicate whether the chip is Hyper-Threading enabled, but it will tell you the native clock speed of the chip.

Since writing the first part of this series, (see *PC User* February, page 61), I've changed the chip in the system from a 2.8GHz non-Hyper-Threading 533MHz frontside bus Pentium 4 chip to a 2.6GHz 800MHz frontside bus Pentium 4. It's not much of a change, but it explains why there's a difference between the setting in last month's article and this one.

Under that, you'll see that the clock speed is set to 2.73GHz and the frontside bus to 840MHz. Putting it simply, I'm overclocking this processor by 5%. How I'm doing it will

become clear over the next couple of months.

Following that is the L1 and L2 cache memory amounts within the processor. These are obviously locked settings, and they show 8KB and 512KB, respectively.

The 'CMOS Ratio Status' option shows whether or not you can adjust the processor clock speed by adjusting the multiplier or ratio setting. Unfortunately, this particular chip has this setting locked down to 13. Because it's locked, it doesn't really matter how you set the Ratio CMOS setting, as it's just ignored.

The 'VID CMOS' setting refers to the Voltage ID setting. Normally, the processor will tell the motherboard what voltages it needs to run correctly, such as the Vcore (core voltage), interface voltages and the rest. The voltages are controlled by the board's voltage regulator module (VRM) and it decodes the VID setting and sets up the correct voltages.

The 'VID CMOS' setting allows you to bypass the CPU default settings and dial up a different setting, which enables you to run the processor at a higher or lower voltage for more speed or lower power consumption. The problem is there are no tables to tell you what the various numbers do, so I recommend you leave this setting as is (there are other ways to change the core voltage that we'll look at in the coming months).

The Max 'CPUID Value Limit' has no real effect on performance and should be left as disabled, as it's used to identify the specific CPU you're using.

Finally, the most important option on this page is the 'Hyper-Threading Function' option. If you're using a Hyper-Threading-ready processor, this should be enabled; although it's likely to be greyed out for Celeron chips.

IDE configuration

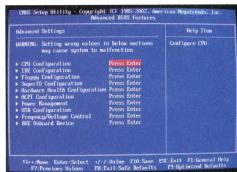
This is where you set up your hard disk and optical drives. This particular system supports four IDE drives and two Serial ATA (SATA) drives, so you need to work through this carefully.

Right at the top is the 'IDE Configuration' option. This allows you to decide whether you want the system to handle standard IDE drives only, SATA drives only, a mixture of both in auto mode, or (in this particular Shuttle BIOS) a mixture of both specifically for Windows 98 or Me-based systems.

The 'S-ATA Running Enhanced Mode' tells the board whether or not you want control over how the SATA ports P0 and P1 are mapped within the IDE controller settings. SATA drives are typically run in conjunction with IDE drives and they are mapped or assigned as the third and fourth IDE controllers. The first two controllers are the standard ones that allow IDE drives to be configured as master or slave.

The 'P-ATA Channel Selection' sets whether one or two IDE controllers are running. You can choose this, but typically, you'd select both to give you maximum drive options.

The 'S-ATA Ports Definition' defines how the two SATA ports are mapped. You can assign P0 as the third IDE controller and P1 as the fourth, or vice versa. To be honest, I'm not sure why you'd need to adjust these



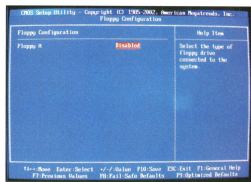
A typical advanced CMOS settings screen.

options to this degree, but they're there if you need them.

After this come the detected drives for primary and slave of the first two IDE controllers, and then the third and fourth IDE controllers, which are in fact SATA ports P0 and P1 as mentioned above. You can see here that we have three drives connected: a slave hard drive on the primary IDE controller, an optical drive on the secondary slave port and a SATA hard drive connected to SATA port P1.

Note that this doesn't tell you the order in which the drives boot up; that's on another setting elsewhere. It's just designed to tell you which drives are connected to which ports. For the record, the SATA drive on P1 is the boot drive in this system. In fact, if you come down and select the 'Fourth IDE Master' option, you get a look at all of the specifics of the hard disk drive on that port.

It tells you the model number, the capacity of the drive, whether it supports LBA (logical block addressing), the Block mode and how fast an interface it supports, and whether or not it handles the SMART feature. We've looked at



If you don't have a floppy drive, disable the controller here.

Self-Monitoring, Analysis and Reporting Technology being (see *PC User* August 2004, page 76), so we won't go into it here except to say that it's a way to find out if your hard drive is about to die before it happens.

Underneath the top window of information is the bottom window of choices, allowing you to change many of those aspects we've just mentioned. Typically, these are left in auto mode, which allows the operating system to make changes as it goes, as there are some settings which are changed whether you format the drives with FAT32 or NTFS. The bottom line is that you should leave these all set to AUTO.

Floppy configuration

This will likely be less of an issue as we go forward, but the 'Floppy Configuration' allows you to set what type of floppy drive is connected to the system.

Normally, this is set to 1.44MB 3.5in, but this is by default rather than for any good reason. If you don't have a floppy drive connected, set it to NONE or DISABLED.

SuperIO configuration

Some motherboard vendors get carried away with their page labelling, and this is a good case in point. SuperIO here means nothing more than the floppy disk drive controller and the serial and parallel printer ports.

If you've set the floppy configuration menu to DISABLED, you can switch the floppy controller to DISABLED here.

The next options allow you to set the serial port and parallel port addresses. This is a throwback to the original IBM PC computer, where these two peripheral ports were mapped to a particular address and given special interrupt

TOP TIP

Never the twain . . .

As we told you last month, no two motherboards will have exactly the same BIOS/CMOS setup screens, so it's important that you read this series in conjunction with your motherboard's manual. That way, you'll be able to locate each setting, know what it does and how it works.

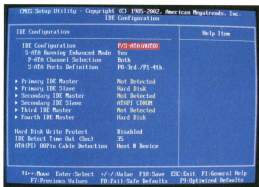
controllers. Basically, an interrupt port is a control line. When a device connected to these ports flags or hits that control line, the computer stops what it's doing as soon as it is able, and runs a set of commands programmed into an application to do a specific task on activation of that control line.

In our example, the 'Serial Port 1 Address' is set to hexadecimal 3F8 and to interrupt request (IRQ) line 4. The parallel printer port is set to its default address of 378; it's set to work in bi-directional mode (meaning it accepts data from the device as well as sends data to it) and its IRQ line is 7.

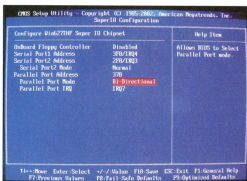
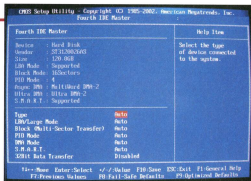
Again, you shouldn't have to change these settings, but they are handy to know about, particularly if you decide you want to start attaching your own homemade electronic devices to the parallel printer port.

Don't forget to check for these settings in your motherboard manual. They're probably located in a different option window, but you should get used to recognising them.

We'll look at further options next month. ☺



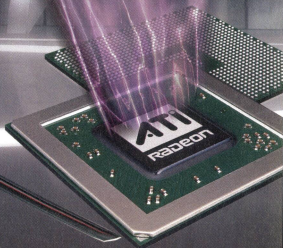
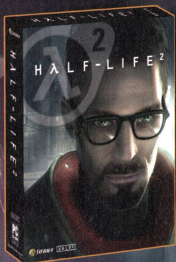
Specific features of each drive can be set via the IDE configuration screen.



The Super I/O screen sets the parallel and serial port parameters.

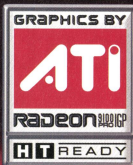


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Diagnosing Linux routing problems

What do you do when you're having problems with your connection? Les Bell explains.

Using the **traceroute** command is good way to diagnose routing problems. It will show the routers through which your datagrams will pass on the way to the destination. However, as with **ping**, don't assume too much — it's possible that routers along the path may be configured not to respond to **traceroute**. For example, at the `[root@sleipnir root]#` prompt, type **traceroute www.pcuser.com.au** and you will get a reply similar to the one shown in **Code A**.

Each line shows the next router along the path to the destination, along with the roundtrip times for three queries and responses. You can see the firewall and upstream router in my office, then a router at Telstra's Kent Street exchange, then the Gigabit Ethernet backbone there, then a link to austr426, and then everything goes quiet. The three asterisks indicate a timeout, after a couple of these, I pressed Ctrl-C to stop **traceroute**. This doesn't mean I can't get to the *PC User* Web site; it's just that a firewall along the way is not responding to the UDP datagrams sent by **traceroute**. In any case, I can see that the link from my office into Telstra's network is working fine.

When using **traceroute** to check distant hosts, you can often see the roundtrip time jump as you cross the trans-Pacific link. **Code B** shows an example. Notice how the RTT jumps from around 20 milliseconds (ms) to 170ms as it crosses the Pacific. By the way, there are fancy graphical **traceroute** programs, such as *Xraceroute*, which can draw a world map to show where your packets are going, but they're really not much help for troubleshooting.

TECH TERMS

Datagram. A packet of data (with the destination address included) sent over an IP network.

TCP (Transmission Control Protocol). A connection-oriented protocol used by services that require reliable transfer to variable-length data, such as email, FTP and the Web.

• DNS configuration

A common problem for users on dialup Internet connections (and sometimes those with DHCP-allocated IP addresses on broadband) is an inability to resolve names into IP addresses. Symptoms include pop-up error messages from your browser, such as "Hostname could not be found. Please check the name and try again", or command line error messages like "Temporary failure in name resolution".

Your machine will turn names into IP addresses by asking a domain name server (DNS), and the IP addresses of one or more DNSes will be set up in the file `/etc/resolv.conf`. The contents of that file should look something like this:

```
search cullen.lesbell.com.au lesbell.com.au
nameserver 192.168.168.1
nameserver 192.168.168.252
```

In this example, there are two DNSes listed, but you can have between one and three entries by default. If you are seeing errors in resolving host names, first check that this file exists, and then try pinging the DNSes listed.

If the file does not exist, you can manually create it using the IP

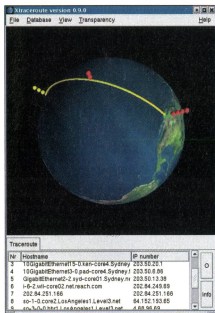
CODE A

```
traceroute to www.pcuser.com.au (203.18.241.23), 30 hops max, 38 byte packets
1 dvalin (192.168.168.252) 0.705 ms 0.289 ms 0.391 ms
2 midgard.lesbell.com.au (203.97.202.158) 1.829 ms 1.553 ms 1.673 ms
3 Loopback1.ken10.Sydney.telstra.net (165.228.2.1) 18.125 ms 17.887 ms 19.615 ms
4 GigabitEthernet2-1.ken17.Sydney.telstra.net (203.50.20.27) 20.833 ms 20.587 ms 19.583 ms
5 austr426.lnk.telstra.net (139.130.238.198) 21.840 ms 21.336 ms 20.195 ms
6 *
7 *
8 *
[root@sleipnir root]#
```

CODE B

A trans-Pacific tracerouting

```
[root@sleipnir root]# traceroute www.ibm.com
traceroute: Warning: www.ibm.com has multiple addresses; using 129.42.21.99
traceroute to www.ibm.com (129.42.21.99), 30 hops max, 38 byte packets
1 dvalin (192.168.168.252) 0.739 ms 0.364 ms 0.265 ms
2 midgard.lesbell.com.au (203.35.202.158) 1.890 ms 1.315 ms 1.292 ms
3 Loopback1.ken10.Sydney.telstra.net (165.228.2.1) 17.909 ms 19.071 ms 19.581 ms
4 10GigabitEthernet15-0.ken-core4.Sydney.telstra.net (203.50.20.1) 31.446 ms 208.883 ms 171.406 ms
5 10GigabitEthernet3-0.pad-core4.Sydney.telstra.net (203.50.6.86) 20.327 ms 20.912 ms 18.271 ms
6 GigabitEthernet2-2.syd-core01.Sydney.net.reach.com (203.50.13.38) 20.309 ms 20.360 ms 19.721 ms
7 1-12-2.wil-core01.net.reach.com (202.84.144.25) 169.611 ms 170.647 ms 168.839 ms
8 202.84.251.166 (202.84.251.166) 191.602 ms 188.565 ms 177.935 ms
9 so-1-0.core2.LosAngeles1.Level3.net (64.152.193.65) 201.521 ms 200.113 ms 202.050 ms
10 so-4-1-0.bbr2.LosAngeles1.Level3.net (4.68.113.173) 201.732 ms 201.403 ms 201.674 ms
11 so-3-0-0.mp1.Denver1.Level3.net (64.159.1.113) 228.770 ms 227.226 ms 229.076 ms
12 so-6-0.hsa1.Denver1.Level3.net (4.68.112.154) 228.021 ms 228.383 ms 237.262 ms
13 unknown.Level3.net (209.245.20.10) 226.879 ms 228.772 ms 230.193 ms
[root@sleipnir root]#
```



A graphical program such as Xtracroute can display a world map to show you where your data packets are going.

addresses of your own DNSes or those provided by your ISP. But if your system is configured by DHCP — for example, if you are using a consumer-grade ADSL or cable modem connection — or it is configured by a dialup PPP connection, the file is normally created or overwritten when the connection is set up. If this is not happening, you will need to check the documentation for your DHCP client program or PPP configuration to try to determine what the problem is. In general, for DHCP you should check your `ifcfg-eth0` file for the presence of a 'PEERDNS=yes' statement; for a PPP connection, check `/etc/ppp/options` for a `usepeerdns` statement.

You can check whether your system is able to connect to a DNS and resolve a host name into an IP address with the `host` command. Type `host fulbert` and you'll see the following:

fulbert.cullen.lesbell.com.au has address 192.168.168.1

CODE C

Using dig to uncover DNS information

[les@sleepinr les]\$ dig www.pcuser.com.au @dvalin.lesbell.com.au

```
<<> Dig 9.2.1 <<> www.pcuser.com.au @dvalin.lesbell.com.au
;; global options: printcmd
;; Got answer:
-->HEADER<< opcode: QUERY, status: NOERROR, id: 17821
;; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 3, ADDITIONAL: 1
```

```
;; QUESTION SECTION:
www.pcuser.com.au.      IN      A

;; ANSWER SECTION:
www.pcuser.com.au.      36417   IN      A      203.18.241.23
```

```
;; AUTHORITY SECTION:
pcuser.com.au.          36417   IN      NS      ns1.telstra.net.
pcuser.com.au.          36417   IN      NS      acphofdns01.acp.com.au.
pcuser.com.au.          36417   IN      NS      acphofdns02.acp.com.au.
```

```
;; ADDITIONAL SECTION:
ns1.telstra.net.        104627  IN      A      139.130.4.5

;; Query time: 3 msec
;; SERVER: 203.35.202.157#53(dvalin.lesbell.com.au)
;; WHEN: Wed Nov 10 14:17:27 2004
;; MSG SIZE rcvd: 152
```

If you need to get down to low-level debugging of DNS lookups, then you really should learn the nuances of the `dig` command. This will let you query any name server for all kinds of information the DNS service can provide. **Code C** shows the type of information produced by using `dig`.

As you can see, `dig` provides a lot of data, including details of the query it sent, the answer it received and how it got the information. Another common use of `dig` is for turning IP addresses into host names by doing a reverse lookup, as in **Code D**.

Common errors

Quite often, everything is configured fine at your end, but there is a firewall between you and the system you are trying to connect to. If it's not your firewall, there's not a lot you can do about that. Although Linux boasts an interesting armoury of tools for getting past firewalls, their use is beyond the scope of this article. If you're trying to connect to your own server, check that you have added a firewall rule to allow access to the appropriate protocol and port number. You can use the `iptables -I` command to dump your firewall rules or edit your firewall configuration file.

If you can ping a machine, but cannot connect to a specific service, and you've eliminated firewall rules as a problem, then check that the daemon you are trying to connect to is in fact running. Use the `ps aux` command to list running processes, and/or use the `netstat -pat` and `netstat -pau` commands to list processes that are listening on TCP and UDP sockets, respectively. If you don't see the daemon you need, then start it with a command like `service httpd start` or `apachectl start`, depending on the Linux distribution you are using.

When you're setting up routing tables in more complex internetworks, a common failing is to think about how datagrams get routed away from where you are sitting, but forgetting that replies have to be routed back again! This may require your host or subnet to be added to the routing table of 'upstream' routers and firewalls.

CODE D

Using dig to do a reverse lookup

[les@sleepinr les]\$ dig -x 203.18.241.23

```
<<> Dig 9.2.1 <<> -x 203.18.241.23
;; global options: printcmd
;; Got answer:
-->HEADER<< opcode: QUERY, status: NOERROR, id: 41638
;; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 3, ADDITIONAL: 1
```

```
;; QUESTION SECTION:
23.241.18.203.in-addr.arpa. IN PTR

;; ANSWER SECTION:
23.241.18.203.in-addr.arpa. 86400 IN PTR techw02.acp.com.au.
```

```
;; AUTHORITY SECTION:
241.18.203.in-addr.arpa. 86400 IN NS ns1.telstra.net.
241.18.203.in-addr.arpa. 86400 IN NS acphofdns01.acp.com.au.
241.18.203.in-addr.arpa. 86400 IN NS acphofdns02.acp.com.au.
```

```
;; ADDITIONAL SECTION:
ns1.telstra.net.        104486  IN      A      139.130.4.5

;; Query time: 2087 msec
;; SERVER: 192.168.168.1#53(192.168.168.1)
;; WHEN: Wed Nov 10 14:19:48 2004
```

Disk management secrets

In the third part of his series on Windows XP's Disk Management tool, Link Harris unravels the right-click menus.

In last month's Windows XP column (page 74), we walked you through using Disk Management (DM) to create a new primary partition on a hard disk. A primary partition is just one of many different types of volumes you're likely to encounter in DM's graphical display. Others include extended partitions, logical drives, free space and unallocated space, and each of these is identified by its own colour code.

Right-click menus

The contents of the menu you get by right-clicking a volume in DM's Graphical View depends on the type of volume so, for example, there's a different range of options for a primary partition, logical drive, free

space, unallocated space, Zip disk or CD.

Be sure to right-click the graphical region representing a volume and not the grey box at the left (labelled 'Disk 0', 'Disk 1' and so on), which represents the entire fixed or removable disk. In particular, the Properties sheet for a fixed or removable disk gives different details from those shown in a volume's Properties (more on this later).

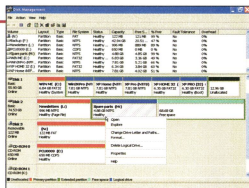
Although you can accomplish many of the same tasks from a Volume List window, it's less confusing to work from Graphical View, and essential if you want to work with unallocated or free space because neither displays in the Volume List window.

Non-lethal options

The following options don't affect the data stored on the volume, and any changes you make are reversible.

Properties. This opens the same Properties sheet you get by right-clicking a drive from a My Computer display. The General tab shows the file system, the total size of the volume, the amount of space used and the unused capacity. For hard disks, floppies, Zips and other removable disks, you can change the volume label and, if the volume is formatted with

The type of volume you right-click determines the options Disk Management will offer.



NTFS, you can opt to compress it and/or enable Indexing Service.

Change Drive Letter and Paths.

This lets you assign, change or remove the drive letter for a logical drive, primary partition, ZIP or other removable disk, or CD-ROM drive. For a removable device, you can also get this option by right-clicking the grey box at the left, which is handy if there's no media in a drive. Here's how it works.

1. If a volume doesn't have a drive letter, click the Add button to assign one. The dialog box suggests the lowest available drive letter, but you can either accept this or choose a different one before clicking OK. (Ignore the second option, 'Mount in the following empty NTFS folder'. We'll show what this is used for next month.)

2. To change an existing drive letter, click the Change button.

3. To remove an existing drive letter, click the Remove button and then Yes. However, remember that a drive won't be visible in My Computer or available to Windows programs if it doesn't have a letter assigned.

Note that you can't change the drive letter assigned to the system partition, boot partition or one that holds a paging file. Also, be warned: if you change the letter assigned to a drive

where programs are installed, the programs may no longer work properly.

You can swap the drive letters assigned to two volumes but there's a trick to this.

1. Change (or remove) the letter for the first drive.
2. Change the letter for the second drive to the one the first originally had.
3. Change the letter for the first drive to the one the second originally had.

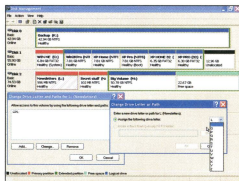
New Partition. This lets you create either an extended partition, or a primary partition in unallocated space on a fixed disk. A removable disk can have only a single primary partition, and can't have an extended partition.

New Logical Drive. This allows you to create a logical drive from free space in an extended partition. Note that you can't format or assign a drive letter to an extended partition; it's only a holding area for logical drives. Although each fixed disk is limited to a maximum of four primary partitions, or three primary partitions and one extended partition, there's no limit on the number of logical drives. Since a removable disk can't have an extended partition, it can't have logical drives, either.

Mark Partition as Active. This option is necessary to make the

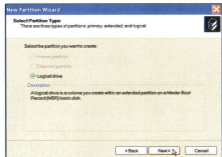
ON THE COVER DISCS

Check out the cool video version of this tutorial on this month's cover discs.



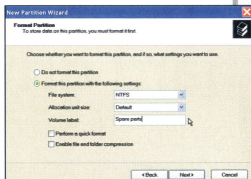
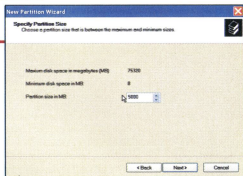
Disk Management displays a list drive letters not used by another volume.

STEP BY STEP CREATE A LOGICAL DRIVE



1 In Disk Management's Graphical View, right-click the free space in an extended partition and select 'New Logical Drive', which opens the New Partition wizard. Click Next at the Welcome screen, and click Next at the 'Select Partition Type' screen ('Logical drive' is the only option).

2 To give the logical drive less than the total available disk space, change the value in the 'Partition size in MB' field before clicking Next at the 'Specify Partition Size' screen. Then, click Next to accept the default drive letter on the 'Assign Drive Letter or Path' screen. You can change this later as explained in the main story.



3 At the 'Format Partition' screen, you can choose whether to format the partition and which file system to use. See 'Format' below for an explanation of the options. You can format the partition later if you wish. Click Next to bring up the final screen and click Finish to add the new logical drive to the graphical display for this disk, and start the formatting.

primary partition on a hard disk bootable. Each disk can have only one active partition (Windows calls this drive C; and looks for startup files there). There's no corresponding 'Mark Partition as Inactive' option. The only way to remove the active tag from a partition is to make another primary partition active on the same hard disk.

However, changing the active partition will probably make your PC unbootable, so you should only do this if you have a very good reason and realise the consequences. If your PC won't boot because the active partition has changed, the safest way to restore it is to use a third-party partitioning tool such as PartitionMagic (available from www.symantec.com.au).

A cheaper alternative, if you're game, is to boot with a DOS floppy that holds a copy of Fdisk.exe, such as a Windows 98/Me Startup floppy. Then, run Fdisk from the DOS prompt, select option 2 ('Set active partition') and follow the prompts. Don't try to do anything else with Fdisk or you risk wiping out your files.

⚠ Lethal options

Either of the following operations will destroy any data stored on the volume.

Format. This is similar to the Format option available from My Computer. You can format a logical drive, primary partition, Zip or other removable disk.

Some points to remember:

1. You can choose the file system for formatting or reformatting the volume. I recommend NTFS for hard disks unless you specifically need access to the partition from an operating system installed on the same PC, which doesn't support NTFS. I also recommend accepting the suggested default setting for 'Allocation unit size', no matter which file system you choose.
2. If you like, you can edit the 'Volume label' field before you format, or you can do it later from the Properties sheet.
3. 'Perform a quick format' doesn't check the disk for errors, so it's safer to leave this option unticked.
4. For an NTFS format you can tick 'Enable file and folder compression', but you can also enable this feature from the Properties sheet after the drive has been formatted.

Note that DM won't let you format either the system partition (where the startup files are located; usually drive C:) or the boot partition (where the Windows XP files are

located, which can be either drive C: or another partition). DM labels these partitions System and Boot, respectively. Similarly, you can't format any partition that holds a paging file, such as the boot partition, but could be the system partition and/or other partitions. If a partition other than the boot or system partition holds a paging file, DM will label the partition Page File. **Delete Partition/Delete Logical Drive.** These wipe out the selected volume and make the space available for something else. For instance, if you want to create a new partition or logical drive, you may first have to delete one or more existing partitions to generate the necessary unallocated or free space. Before you can delete an extended partition, you have to delete all of the logical drives it contains. DM won't let you delete the system partition, boot partition or one that holds a paging file. Neither can you delete the partition on a Zip or other removable disk.

Next month, we'll continue managing basic disks. 🐼

TOP TIP

Removable media

Zip and other removable media devices (apart from CDs) are labelled Removable in the grey identifier box at the left of Disk Management's Graphical View. Although you normally avoid the grey box when right-clicking the grey box when right-clicking the grey box is the right move: if you want to eject the media from a drive, or if you want to change the drive letter or path when the drive is empty.

Add a second hard drive

Terry O'Shanassy
explains how to
install and partition
a drive for use with
Windows 98.

ON THE COVER DISCS

Included on this month's cover discs are the Windows-based versions of drive installation utilities from Seagate, Maxtor and Western Digital, as well as TweakUI 1.33.

These days, even the least expensive of new hard drives have heaps of storage space. If you find yourself constantly cleaning up, adding a second hard drive is an easy and affordable alternative.

Physically installing a new drive is the easy part, but if you're not confident about doing it yourself, have a computer shop install it for you. Setting up the new drive for use with Windows 98 is another matter. In this article, we show you how to set up the new drive and use it as a second hard disk.

● Install the new drive

You'll find specific installation instructions in the support section of your drive manufacturer's Web site, but here's a general guide.

First, make sure you disconnect the power cable

from your PC before opening the case, and avoid directly handling any exposed components on the underside of the drive when installing it. Connect the power and data cables, and boot up your PC. Watch the POST screen and check that the drive is detected by the BIOS.

On some older systems, the full capacity of the new hard drive may not be 'seen' by the system. New hard drives can be used with a jumper setting, which limits them to 32GB to overcome this problem, but you can also use installation software to enable the full storage capacity of the drive.

● Partition and format the drive

Your new hard drive will not be immediately seen by Windows. The BIOS will have identified it, but you need to create and format at least one drive partition on it before Windows can use it. There are several ways to do this.

● Fdisk is a command line Windows 98 utility you can use, but you'll need to update it first. Download and install the updated version of Fdisk mentioned in the Microsoft Knowledge Base article at <http://support.microsoft.com/?kbid=263044>. Fdisk can be run from a floppy disk to create partitions prior to installing Windows, or from within

Add an extra hard drive to your system and partition it to keep Windows uncluttered and your data organised.

Windows to create partitions on an additional drive. Drive partitions need to be formatted after they are created with Fdisk.

● The second alternative is to use commercial partition management software to set up your second drive.
● You can also use the software tools available for download from the drive manufacturer's Web site for the task.

Using partitioning software or the free manufacturer utilities will allow you to overcome the size limit if your new drive is not fully recognised by your system BIOS. Both will also format the drive partitions for you, as well as create them. They are better choices, than using Fdisk and formatting the drive partitions afterwards.

Choose one of the above methods, then split up the drive into separate partitions for programs and for data files, if desired. Separate partitions for programs and data are the best approach to take to ensure that your system stays organised and efficient.

● Move your programs

Unfortunately, you can't simply 'move' all your programs to the new drive. You'll have to individually uninstall and then reinstall each of them, ensuring that the program directory is located on your chosen drive.

You can make things easier

for yourself by using TweakUI to change the default location for your Program Files and Common Program Files directories before you start. Choose 'Custom Installation' whenever it is offered, and edit the drive letter of the suggested program directory if you need to. Avoid using Automatic or Recommended install routines, or you may not be presented with the choice.

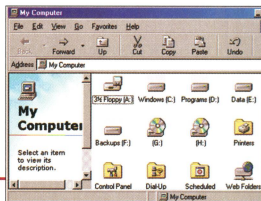
● Move your data files

Change the default location of the My Documents folder by using TweakUI, copy and paste the entire contents of the old My Documents folder to the new location, and then delete the original My Documents folder. Move any other data folders you use to their new location as well.

● One partition?

You may be asking, why not simply have one big partition? It's tempting, isn't it? Although it would seem easier to install everything to the one partition as before, remember that Windows 98 can get itself into enough trouble on a small drive, without adding the extra jumble a large drive invites.

Windows 98 only really needs a few gigabytes of drive space to operate in. Keeping it separate reduces clutter and fragmentation, and leads to more efficiency. Keeping your program installations on their own partition does the same. And finally, keeping your data on its own partition helps protect it and makes backing up much easier. ☺



TOP TIP

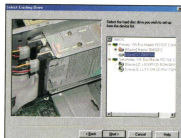
Windows location

To simplify installation of future Windows components, you can copy the entire 'Win98' folder from your Windows CD to a location on your new drive. The next time you are asked for your Windows CD simply enter the location where you have it stored. You should not need to be asked for your Windows CD again afterwards!

STEP BY STEP

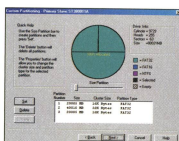
USE DISCWIZARD TO SET UP A SEAGATE DRIVE

If your new drive is a Seagate model, DiscWizard (included on this month's cover discs) is one of the easiest ways to install it in Windows 98.



1 Close all open programs, including those running in the system tray.

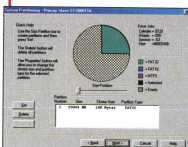
If you've installed DiscWizard after adding the drive, agree to the prompt asking if you wish to set up the drive. Otherwise, choose the 'Setup New Drive' option from the Menu screen. Choose your newly fitted drive from the list presented.



3 Repeat step 2 to create any further partitions. Here we've created a 40GB partition for data storage, and a 20GB partition for downloads and backups of important work. Choose a partition structure that suits you.

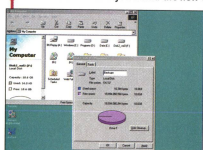
2 Choose the Custom setup option, so you can create multiple partitions. Select 'Additional Storage' as the setup method. Drag the 'Size Partition' bar to set the size of your first partition. The example shows a

partition of about 20GB for program installations. You can use the right and left arrow keys for finer adjustments. Click the Set button when you are done.

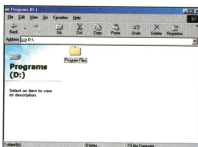


4 DiscWizard will proceed to create and format the partitions for you. When your system reboots, it will inform you that the process has been successful. Exit DiscWizard and you'll find the new drives listed in My

Computer. Right-click on each of the new drive icons, select Properties and enter a descriptive name for each volume.



MOVE YOUR PROGRAMS AND DATA



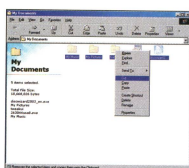
1 Create folders for your new default program and My Documents locations.

In My Computer, open your new 'programs' partition. Create a new folder and name it Program Files. Open the folder and create a subfolder inside it called Common Files. Finally, navigate to your new 'data' partition and create a folder there called My Documents.



2 Install TweakUI, launch it from Control Panel and select the 'My Computer' tab. Change the 'Special Folder' settings for Program Files, Common Program Files and My Documents. Select each in turn from the drop-

down list, click on the 'Change Location' button, and browse to the new folder you created. Click Apply when completed, and then reboot to have the changes take effect.



3 Open the original My Documents folder (on

the Windows drive) using My Computer and go to Edit -> Select All. Right-click on the highlighted files and select Cut. Navigate to the new My Documents

Folder, right-click inside it and select Paste. The contents will be transferred to the new location.



4 Uninstall and reinstall your software. Here, IrfanView is being reinstalled from the new 'backups/downloads' partition, and automatically being located in the new 'programs' partition.

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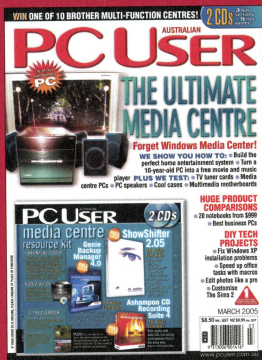
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Making movies on the cheap

Microsoft's movie editor makes editing your videos simple. Philip Moore shows how to get started.

Although we tend to focus on the commercial video editing programs in this column, there is a free alternative available to any Windows XP user; in fact, you probably already have it installed. It's Microsoft's own Movie Maker. The latest version (2.1) comes as part of the Service Pack 2 upgrade for Windows XP.

While Movie Maker doesn't compare to a dedicated commercial program, a lot of people are nonetheless using Movie Maker for their first efforts at video editing on the PC. So, this month we take a good look at this free video editor and show you how to get the most from it.

● Capturing your video

Before you do anything, make sure you are working in the correct format. Start up Movie Maker and click Tools → Options → Advanced tab and change the 'Default Video' properties from NTSC to PAL. Also change the aspect ratio from 4:3 to 16:9 if you have shot video in widescreen mode on your camera.

When capturing video for editing, we recommend using the best possible quality: DV-AVI. You can then render to whatever distribution format you want at the end.

The first step is to capture

your video from your digital video (DV) camcorder. You will need a FireWire card in your computer with a suitable cable. Insert a DV tape in your camera and connect your camera to the FireWire cable and turn it on. Do not turn on the camera until the cable is plugged in. Switch the camera to VCR mode. Windows should automatically recognise the new device and within a few seconds, the camera will be available as an external tape device.

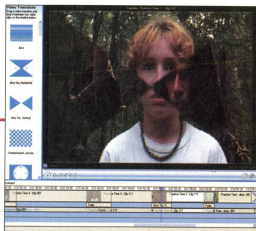
Within Movie Maker, click the 'Capture from Video Device' link in the 'Movie tasks' menu. You will see the dialog shown in **figure 1**. There are three methods of capture offered. The first, 'Best quality for playback on my computer' will compress the incoming video into Microsoft's WMV format. WMV will save you hard disk space, but it means that the quality of the video you will be editing has already been compromised.

The second option is 'Digital Device Format (DV-AVI)'. This is the one we recommend using. It will capture your video in its native DV format, saving it as an AVI file with no further compression or loss of quality. Of course, it will use up heaps more hard drive space, but you can always render to WMV when you have finished editing.

The third option lets you choose a couple of other WMV bandwidth options. Choose 'High quality video PAL' here (rather than option 1) if you need to conserve disk space and don't mind a bit of WMV compression.

Although Movie Maker will split your capture into clips, it is still saved as a single file on the hard disk. So, deleting a clip does not remove it from your hard drive.

Adding a transition to a clip is as easy as drop and drag.



The next step lets you choose whether to capture the entire tape or manually select sections. When the capture is finished, each 'shot' will appear as an individual clip in the Collection. From here you can just drag the clips you want to use into the timeline/storyboard and delete the ones you know you don't need.

Clips captured from one tape all appear as a single collection, but imported files each appear as their own collection (which we think is rather silly).

You can also import videoclips from earlier projects, regardless of the format, as well as still images and WAV audio files for sound effects or background music.

● Editing

Movie Maker lets you choose between Storyboard mode or

Timeline mode for editing. Storyboard lets you see each clip as a thumbnail (using its first frame for the image), with transitions clearly visible between each clip. This is good for organising what order your shots are to go in. Timeline mode gives a better sense of the duration of each shot, as well as offering a second audio track for music or effects, and a Title Overlay track.

You can edit in either Storyboard or Timeline mode, and switch between the two using the 'Show...' button just above the timeline.

In Timeline mode, you can trim a clip by grabbing its end (the cursor will change to a red arrow) and dragging it longer or shorter. The current frame will show in the preview window, so you can see where to trim to. You can also 'scrub' through the edit by clicking the mouse at the

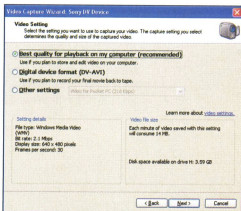
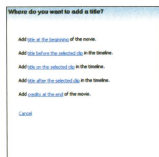


Figure 1. For the best possible quality, select the second option.

STEP BY STEP CREATE A TITLE IN MOVIE MAKER



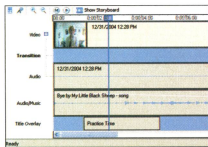
1 Switch to Timeline mode, which will reveal the Title Overlay channel.



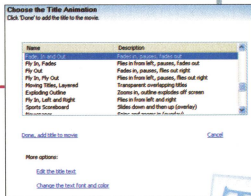
2 Go to Tools —> Titles and Credits. You will see the wizard shown here. Select whichever options best suit where you want the title to appear.



4 Click either the 'Change the title animation' or 'Change the text font and color' options, and you can adjust these settings. Keep in mind that changes apply to all text blocks; you cannot alter them individually. When you're done, click the 'Done, add title to movie' link.



3 Enter the text for your title. This screen will vary depending on what you chose in the last step. Here, you can see there are two boxes that allow you to add two separate blocks of text.



5 The title will be added to the main video track in your timeline. As such, it will appear over a coloured background. If you want the title to appear as an overlay over your videoclip, simply drag it from the video track to the Overlay track and position it where you want. Should you need to alter its colour or animation, just double-click the title clip and repeat step 4.

top of the timeline (where the little blue box is) and dragging back and forth. You can split a clip at the current cursor point using the button found at the bottom-right of the preview window, or pressing Ctrl-L. Instant cross-fades can be created by dragging a clip in the timeline over its neighbour. These appear as a 'fade' in the transition track.

Transitions can be simply dragged into place from the 'Video Transitions Collection' in storyboard mode, or to replace the default Fade in Timeline mode.

Likewise, you can drag video effects directly onto a clip for an instant change of look. Just click the 'Video Effects' Collection and choose an effect. Aside from several fade in and out effects, there are some cool ones that let you create an 'old film' look, or mess with the colours or speed. You can apply

multiple effects to a clip, but unfortunately, there is no way to modify or customise these. Regardless, they are still pretty good for a free program.

On the audio side, select an audio track in the timeline and right-click. Here you will see a few options to fade the sound in or out, mute it, or adjust its overall volume (within that clip). These controls should suit most simple projects, although there is no master mix panel, envelope controls or audio effects.

Make your movie

When you have finished editing, you can then export or render the final edit to a single file. Go to File —> Save Movie. This will

start a wizard. Selecting 'DV camera' will let you record your movie back out to your DV camera. If you originally captured in native DV format, this will ensure the best quality for your master tape. Movie Maker will first render the entire movie as a single file, and then play this down the FireWire cable to your camera.

The next best options for creating a master are the 'My Computer' or 'Recordable CD' choices. There is no option in Movie Maker to save to a DVD or MPEG format file. As with capturing, the 'Best quality (recommended)' setting is not what a master, as it is compressed WMV. You are better off clicking

the 'Show More Choices' link and within 'Other Settings', choosing the DV-AVI option. This will save the best-quality master file for you, although you may not be able to fit it onto a CD-R. (If you really want a CD-R backup, choose 'High Quality Video (PAL)'. It will be WMV compressed while still keeping the quality as good as possible.) If you have a DVD burner, you can then back up this master file to a DVD, or use a separate DVD authoring tool to convert it to MPEG-2 and burn to a DVD-Video disc.

There are other options if you intend to post your video to a Web site, or on a network for others to view. In these cases, WMV is an excellent choice.



A videoclip in Timeline mode.

Digital brushes

Just as a painter will have a range of brushes for all sorts of needs, digital painters need a range of brushes, says Helen Bradley.

When you're painting a picture, you pick a brush of the appropriate size and shape for the task at hand. There are literally hundreds of different types of paintbrushes, even without delving into texture tools like sponges and towels. The digital artist and photographer can also make use of brushes for all sorts of effects. In fact, complex collage-style images can be created in minutes using a selection of brushes and layer blend modes. This month, we show you how to locate and install brushes in Photoshop, and how to use them for a range of photo effects. You'll also see how to make your own custom brushes to use in any Photoshop image.

What is a brush?

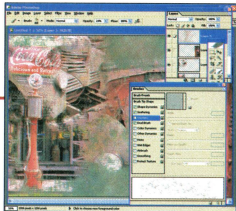
Brushes in Photoshop and other graphics programs are used to

determine the shape of the line you paint with when you use the paintbrush tool. They also determine the shape of the eraser when you erase around an image or through it. You will already have had experience with different brush shapes: circles, ovals and so on. However, there are many specialist shapes available that you can also use. One typical use for these is to create patterns in your image. For example, they're a great tool for blending two images into each other, as you might do if you're creating a collage.

You can also create art using brushes. If you have a good selection of brushes, you may not even want to use photos; you can still create some wonderful images using just the brushes, colours, blends and filters. Brushes also overcome the 'I can't draw as well as I'd like to' problem, as they can contain drawn objects that do the drawing work for you. There are literally thousands upon thousands of brushes available on the Web; some are free, others you will have to buy. A quick search for **Photoshop brushes** in Google will show you that there's an entire world of brush possibilities out there.

Brushes are greyscale images, so when you paint with them, they take on the colour of

By using a combination of erasing and painting with brushes, you can create very complex collage images very quickly.



the paint you've chosen. It isn't possible to have brushes appear in colour. However, since brushes can be greyscale and don't have to be purely black-and-white, they will show gradations in colour when you paint with them. So, for example, if you paint with a greyscale brush in a turquoise colour, you'll get colour ranging from full saturation to partial saturation, depending on the greys/blacks and whites in the brush.

To find brushes in Photoshop, choose a tool that uses brushes and, from the Tool options palette, display the available brushes. You can choose any of these and adjust it to the size you want.

However, that's not all you can do. If you go to Window → Brushes, you will see that there is a range of other options you can use with the built-in brushes. For example, select a brush and then set the Scattering options for it, so that instead of forming a straight line when you paint with it, the brush shapes are scattered in all directions. Then, when you paint with the brush, it will form a more interesting surface texture on the image. This not only makes the result less harsh, but it saves you time in having to move the brush to create the complex result yourself. You can even apply textures to brushes and make them look distressed.

Quick and easy collages

To create a photo collage in Photoshop, first create a single coloured background using the

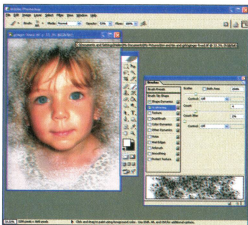
Fill tool, apply the Difference clouds filter to it, and then colourise it using the Hue/Saturation tool. When you start with a filled textured background, you'll find it easier to create the photo collage. Now drag and drop photos into the document, then size and arrange them as you want them to appear. Where the images overlap, you can soften and blend them together.

Choose a brush and the eraser tool and start erasing the hard edges of the photos, so that either the background or another image appears underneath. Continue to erase and configure various settings for the brushes, such as the scatter, texture and size of them. Not only can you erase parts of your photos, but you can also apply colour to the image using these same brushes. Use colours sampled from the image or those that complement or contrast with it, and you can build very complex layered images very quickly.

Brushes made from interestingly sized and shaped pieces of text also look good as part of a collage. Remember that in most cases, you don't want to see recognisable words, but just the suggestion of them — their shapes and outlines.

Ideas for brushes

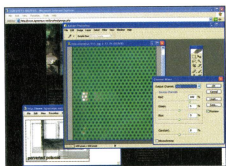
The step-by-step example opposite shows how to create your own brushes in Photoshop. You can create these for a range of purposes and from a range of different images. For example, create a



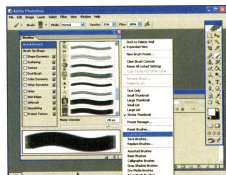
Using the brush preset options, you can configure what appear to be simple brushes to perform more complex effects.

STEP BY STEP **MAKE A BRUSH IN PHOTOSHOP**

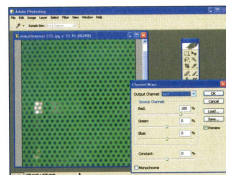
Here's how to install and find downloaded brushes in Photoshop, and how to create your own brush.



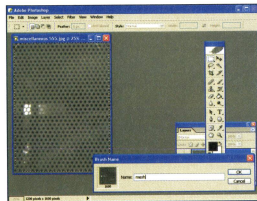
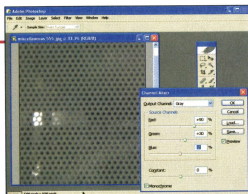
1 Locate a site with brushes (like this one from www.1greeneye.net) and select the brush to download, ensuring you choose Photoshop-style brushes because Photoshop cannot use other programs' brushes. Unzip the file containing the brushes.



2 Launch Photoshop and go to Window → Brushes, click the menu and choose 'Load Brushes'. Browse to where the brushes were unzipped and click them to load them into the brushes palette.



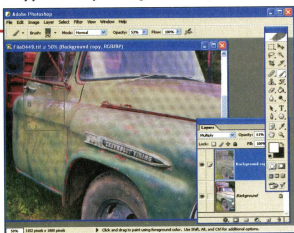
4 Click Monochrome and adjust the sliders until you have a good range of colours from black through grey to white in the image. Click OK to finish, and then select the area to convert to a brush using your preferred selection tool. You can select the entire image if desired.



5 Go to Edit → Define Brush Preset, type a name for your brush and click OK. You can now discard the image if desired. To use the brush, open an image and select the Brush or the Eraser tool — these both use the brush shapes.

6 You can select your brush from the list of brushes (it will be at the bottom of the list), and adjust its size to suit. Select a colour to use if you're painting, and you can then paint on the image with your brush in the same way you would any of the regular Photoshop brushes.

3 To create your own brush, first open an image to use as the basis of the brush. Here, we've used a photo of a piece of metal mesh. Convert the image to monochrome using the Image → Adjustments → Channel Mixer dialog.



brush from your company logo or from images of people. You can also convert text to a brush, or scan an image or a piece of text and use that. You can also make brushes from any image

or portion of an image, whether it's recognisable as an object or not.

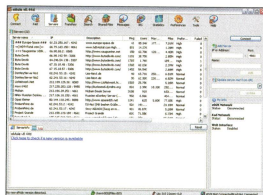
If you're looking for things to practise with and which will be useful, consider scanning or

photographing coins, buttons, coffee beans or things like paper clips, and make brushes from these. I prefer to make larger-sized brushes and scale them down later on when I

come to use them. You will find that having a range of brushes that include recognisable objects and pure textures will come in handy. ☺

Riding the eMule

Nathan Taylor shows how to use the enormously popular file-sharing tool, eMule.



The eMule server connection screen.

Along with BitTorrent, another P2P network that the movie and music makers would dearly love to shut down is eMule. Originally popular with movie traders because of its exceptional ability to handle large files, eMule is now massively popular with file traders of all stripes, and more and more legitimate, legal downloads are appearing on the network.

eMule began life as an open-source clone of file-sharing program eDonkey2000 (hence the network is often referred to as the eDonkey network), and quickly became more popular than the original program. Being open source, a number of modified versions of eMule have sprung into existence.

In many ways, eMule is easier to use than BitTorrent. It is entirely self-contained; that is, you don't have to go out onto the Web looking for torrent files or the like. It works very much like Kazaa or Napster: install the program, do a search, and double-click on any files matching your search query that you'd like to download. In terms of the number and variety of files available, no other peer-to-peer program can match it.

On the downside, it tends to be considerably slower than BitTorrent, especially if you're trying to get hold of rare files. With eMule, you may have to wait several days before your download even starts.

As with BitTorrent, files are broken into chunks, and you can be downloading multiple chunks of a single file from different users (in fact, you

may be downloading a single file from dozens of users simultaneously). By the same token, you can be sharing chunks of an incomplete file—in effect, sharing the parts you have while downloading the parts you don't.

As with any other peer-to-peer program, you will need to open a port in your software firewall (if you use one) and/or set up port forwarding on your router. The default port for eMule is 4662, although this can be changed in the software settings. As with BitTorrent, it is possible to use eMule without an open port (you get what is called a LowID when it tries to connect to the network), but it will be incredibly slow since other eMule PCs will not be able to communicate directly with your PC.

Getting started with eMule

All you need to get files from the eDonkey network is an appropriate client. For beginners, we recommend installing the official eMule client from www.emule-project.net.

On installation, a wizard will guide you through the basic setup. You'll be asked to provide a username (it's generally not a good idea to use your real name), change the default port numbers for your firewall settings, set your upload and download speeds, and set a few other parameters. For now, we recommend you keep the default settings.

The first screen that will appear will be the Servers screen. eMule comes with a list of servers, and new ones will be added once you connect to the network for the first time. Servers

with eMule work a little like BitTorrent trackers—they keep track of who is connected to the network, and who is sharing what. When you search for a file, the eMule client will ask the server who has the file. It generally doesn't matter which server you connect to, since the servers talk among each other, so when you're connected to one server, you're effectively connected to them all.

To connect to a server, simply click Connect at the top right-hand corner of the screen. The display at the bottom-right of the screen will tell you when you have connected, and if you have a HighID (which is good, indicating that you have no firewall problems).

You can then search for a file by clicking on the Search button at the top of the window. Under the Name field, type the text of the file you want to search for. It's a text comparison with the filenames, and doesn't have to be complete or exact. For instance, if you were looking to download a Linux distribution, you could type **linux distribution** in the box and press Enter.

There's also a field you can change called Method. By default, it's set to 'server', which means that it only asks the server you're connected to for search results. You can also set it to 'Global (server)', which means that it asks every eMule server for the file. This takes longer, but is more comprehensive.

In the bottom panel, a list of matches for your search term will appear. Double-click on any and all files you want to download. The number in the

Avail column tells you how many people are sharing that file. The higher the number, the more quickly you're likely to get that file.

Next, go to the Transfers tab by clicking the button at the top of the window. This screen shows the status of all your current downloads, including a graphical bar that shows you which chunks of a given file you have, along with the total number of sources for the file (and also how many of those sources you are connected to). This screen also tells you where you are in other people's download queues (which we will delve more into next month). You can cancel a given download by right-clicking on it and selecting Cancel.

In its default setting, eMule saves completed files to a subdirectory in your eMule directory called Incoming. Before they're complete, files are stored in a subdirectory called Temp. Both of these directories can be changed in the Preferences screen by clicking the gear icon at the top of the window.

It's also worth noting that your chosen download directory will automatically be shared with other eMule users. Anything in that directory will be available to other users on the network, so be careful what you put in it. You will also be forced to upload any files that you are currently downloading.

Next month, we'll continue our look at eMule and discuss servers, queues, upload limiting, eMule Web links, LowIDs and how to get the best speeds from the network. ☺

Matching colours

Ever wondered which colours work best together? Helen Bradley shows you how to ensure your colours don't clash.

In primary school you learned that red, yellow and blue are the primary colours. Using these colours, it is possible to mix other colours such as orange, purple and green. This is just one type of colour wheel and there are numerous others; in this column, we take a look at another type. We also discuss how you can use either of these as a tool for creating colour schemes that are guaranteed to work with each other.

One colour wheel you may recognise is an RGB (or red, green and blue) colour wheel. This is the one you'll see in many graphics editors when you're working in 'RGB mode'. This is typically the mode you'll use when designing for the Web.

ON THE COVER DISCS

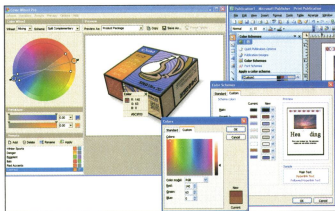
On this month's cover discs you'll find a trial version of Color Wheel Pro 2.0.

This colour wheel is based on colours of light; mixing red, green and blue together gives white, and an absence of any of these colours is black. The more traditional red/yellow/blue colour wheel is applicable to mixing paint colours. If you are preparing documents for commercial printing, you will use a CMYK colour space where the primary colours are cyan, magenta and yellow — the K stands for black, which is printed as a fourth 'colour' rather than being created by printing the other three colours on top of each other.

Using a colour wheel

When looking for colours that work together, you can use a colour wheel to help make your choices. You do this by selecting colours dependant on their placement relative to each other on the colour wheel. There are a number of arrangements and each has a special name. You're almost guaranteed to choose colours that work well together if you use one of these schemes.

You can buy a colour wheel at any art supply shop for a few dollars; this is a set of paper circles fixed in the middle that turn independently of each other. You line up the pointer against one colour and then read the other colours from various colour schemes using



Once you know a colour's RGB values, you can use these in a program like Publisher to populate one of your colour schemes.

the markers on the paper.

It is also possible to do this on the computer. The illustrations on this page have been created using the Color Wheel Pro software (www.color-wheel-pro.com), which we've included on this month's cover CDs. When using this software, you can choose from a Visual or Mixing colour wheel — we're using the Mixing one, as it's the one you're probably most familiar with.

The simplest colour scheme to understand is the monochromatic scheme, where you use different shades and tones of a single colour. So, for example, if your basic colour is red, you can use red itself plus the same red with varying amounts of black or white added to it. Monochromatic colour schemes can look very professional yet they are understated.

Red and green

Your mum may have told you once that red and green should never be together, unless it's on a Christmas tree. In fact, red and green bear a very special relationship to each other: they are complementary colours, opposite each other on the colour wheel. Other complementary colour schemes are orange and blue, and yellow and purple. Complementary colours used together are high

contrast and demand attention. However, they are generally more difficult to work with, as you don't have a lot of variety in the colours you will be using.

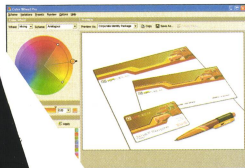
Multicoloured schemes

An analogous colour scheme is one where the colours are adjacent to each other on the colour wheel. So, for example, red, purple and blue are analogous colours as they are side by side. Of all the colour schemes, this is probably the easiest to use and looks good, provided you limit yourself to a handful of colours from the available range.

Another version of the complementary colour scheme is the split complementary. In this case, you take the colour plus the two colours either side of the opposite colour. So, if you use red as your colour, you will use blue-green and yellow-green, which are the colours either side of green.

A tool like Color Wheel Pro not only lets you experiment with colour schemes, but also to see them at work in typical situations such as on a Web page or in a corporate identity package. You can save schemes that you like and click on colours in the scheme preview to see their RGB values. If you know a colour's RGB value, you can recreate that colour in a program like Publisher by typing in the value.

Next time you're stuck choosing colours, think about the colour wheel. Select from one of the schemes and you'll be surprised how good everything will look.



A complementary colour scheme is based on colours opposite each other on the colour wheel. It is a highly contrasting scheme.

Managing projects

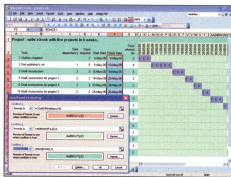
Helen Bradley explains how to use Excel for basic project management.

While Microsoft Project is undoubtedly the project management tool of choice for many businesses, it has a steep learning curve. If your project management needs are relatively simple, using Project to manage them is like cracking a very small nut with a very large hammer. Instead, if you already know Excel, chances are that it can do the job for you, at least to an acceptable level. This month, we look at how you can use Excel to outline a project and create a visual representation of the task.

If you think you've never done any project management before, you're wrong. Just getting up in the morning and getting to work involves project management skills. For example, you must do certain tasks in order, like showering and then dressing. Some tasks can't be started before others are complete, although you can do some simultaneously, such as eating breakfast and reading the newspaper. If you don't have your project planned properly and timed well, you won't get to work on time. Essentially, much of the project management most of us do is just a bigger version of getting to work every day.

Although we're using the 2003 version of Excel for our project management worksheet, you can use any version of Excel you like, from 97 forwards. Excel 97 was the first version in which conditional formatting was available; this is the feature we're using to format the project worksheet.

Start with a new blank workbook and, down the left two columns, put a list of task numbers and descriptions of the tasks you need to perform to complete your project. These are the various steps that you need to complete to finish it. Our example is one relating to



writing a book comprising an introduction and five detailed projects. We've listed the steps for getting the book from concept to mailing to the publisher.

We suggest you follow our example, as it's simple enough to understand and follow, and there is not a lot of typing to complete it. Along the way, you'll get a good feel of how the process works and how to adapt the solution to your project-tracking needs.

Like any project, some tasks will be dependant on successful completion of other tasks. In the cell next to a task, enter a reference to any task that this particular task is dependant upon. If there are multiple tasks that it is dependant upon, list them all in the cell, so you're clear what has to happen and when.

Label the next columns **Days Required**, **Starting Date**, **Finish Date** and **Days Allowed For**. The **Days Required** will be the number of days the task will take you to complete, and this excludes weekends. So, if a project takes a week and you take Saturday and Sunday off, then it requires five days and you should enter **5 days** in this column.

The **Starting Date** is the first date you will work on the task, and the **Finish Date** is the last day you work on it. So, a task that takes one day to complete will start and end on the same date; a task that requires three days and which starts on a Monday will finish on the Wednesday. Of course, if this same task starts on a Friday, you'll have to jump the weekends, but we can get Excel to help alert us to this problem.

Begin entering the starting and finishing dates for your tasks. A task that starts immediately after another one finishes can have its start date entered by referencing the finishing date of the task before it. However, to do so, you must take into account weekend days and holidays. While you'll still need to manually adjust for holidays, here is a way to calculate the start date for a task based on the finishing date of the task prior to it. Enter this in cell E4 and copy it to all cells that relate to tasks which start when another one finishes:

=IF(WEEKDAY(F3)<=5,F3+1,IF(WEEKDAY(F3)=6,F3+3,F3+2))

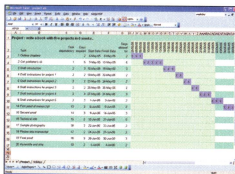
This formula calculates on what day of the week the previous task finished (1 = Sunday, 7 = Saturday) and uses this information to determine the date the next task will begin.

To identify start dates calculated this way that are destined to begin on a holiday, you can use a conditional format. This identifies the cell as containing a holiday date, so you know to fix it manually. To do this, create a conditional format to format the cells E3:E17 using the condition **=countif(holidays,E3)**, and set the format to a colour that will show clearly.

If any of the start dates for your tasks begin on a holiday, you'll now see an indicator of this, and you can manually adjust the start date one day ahead (or two if you still encounter problems). You can also use this on the cells in column F (this time, the formula should read **=countif(holidays,F3)**) to visually identify any holidays entered as finishing dates. The step-by-step example opposite shows how to create conditional formats if you're unsure of how to do this.

If you need to identify whether any of the dates you have entered happen on a weekend, you can add a second conditional format like this, which will flag any cell that contains a weekend date:

=weekday(F3,2)>=6

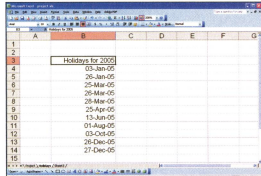


ON THE COVER DISCS

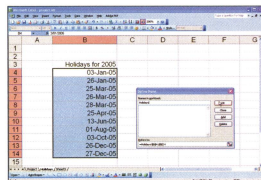
To save you time, you will find the example Excel file, **project.xls**, on this month's cover discs.

STEP BY STEP BUDGET YOUR TIME

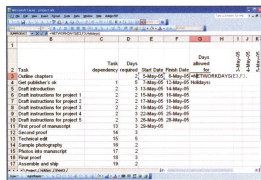
Here's how to use the **NETWORKDAYS** function to calculate how much time you have budgeted for each task, and a conditional format that will point out any occasion when you have not allowed for the required amount of time.



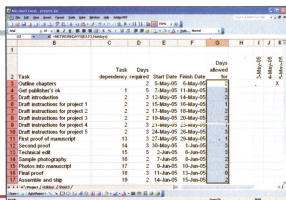
1 To use the **NETWORKDAYS** function, begin by creating a list of holidays. You don't have to worry when it begins and ends, so long as all the holidays you want to take into account during the project are included (only include holidays, not weekends). Create this list on a separate sheet.



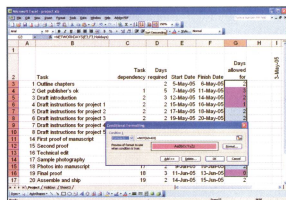
2 Select the list and click Insert → Name → Define, type **Holidays** as the 'Name in Workbook' entry and press Enter. This name can then be used in your formulas to indicate the timing of holidays.



3 Click in a cell to make a calculation of the days between two dates. In cell G3, for example, enter this formula to calculate the number of workdays between the date in cell E3 and cell F3, including both dates: **=NETWORKDAYS(E3,F3,Holidays)**.

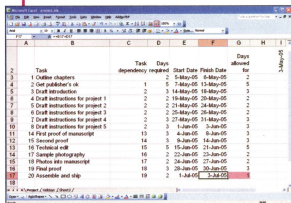


4 You can now copy this formula down column G to calculate the number of days that you have allowed for each of the tasks in accordance with your projected timeline. Use conditional formatting to identify tasks that you have allowed too much or too little time for. Begin by selecting the range G3:G17, even if you haven't put in all the dates.



5 Go to Format → Conditional Formatting and choose 'Formula' from the first box. Type **=not(G3>D3)** and click Format, and configure a format for this particular alert. It is a format you'll only see when there are problems, so don't hesitate to make it stand out.

6 Click OK and you will see all cells marked where the number of days required for the task doesn't agree with the number of days allocated to it. You can now adjust the timing for the task or the dates allocated to it so they match. When they do, the highlighting disappears.



Identifying holidays and weekends

One Excel formula can calculate date intervals, taking into account holidays and weekends. It is **NETWORKDAYS** and it is included in the Analysis Toolpak. To enable the Analysis Toolpak, go to Tools → Add-Ins, locate the Analysis Toolpak and enable in the list. If it is not currently installed (and it may not be), you should install it from your original Office or Excel CD before using it.

The **NETWORKDAYS** function takes as its arguments a start and end date, and a list of holiday dates. It calculates the number of workdays between those two dates excluding weekends and holidays. The step-by-step example on page 105 shows how to create the formula for cell G3; specifically, how to copy it and format the column to report the situation where you think you've allocated the right number of days to a task (but for some reason, you have not).

When creating conditional formatting, be aware that the first format which is matched will be the one applied to the cell. So, create formats for error reporting (like these are) before you create formats for regular formatting. In addition, if you apply a conditional format to a single column and then apply a conditional format to a range including that column, the original conditional format will be lost and you won't be warned that it is about to happen.

When fixing up the dates for your tasks, the conditional formats should tell you where problems have occurred. Work downwards, starting at the first date, adjusting the start and end dates for each as necessary until the colouring has gone from the cells. For any task dates that are dependant on the finishing dates for prior tasks, there's no point in fixing starting date problems until you've sorted out any problems with earlier finishing dates. The idea is to have your problems percolate down the worksheet and ultimately be removed.

Charting the project

Excel can help you by producing a visual chart of the project itself. Begin by creating a list of weekday dates across row 2. To do this, enter the start date for the project in one cell (cell J2 will do). Right-click and drag the fill handle for this cell to the right. When you let go, you can select 'Fill Weekdays' to fill the range with weekday dates.

To plot the days where a task is due to be performed, enter this in cell J3: **=IF(AND(J\$2>=E\$3,J\$2<=F\$3),"X","")**

This formula can be copied down the current column and

across all the columns of your worksheet. It compares the date in cell J2 (the dates you just entered) and, if they are in the range between the start and finish date (or they match either date), the cell will contain an X, indicating this is the date for that task to be performed. The absolute cell addressing used in the formula ensures that it can be copied in both directions without requiring any alteration.

To make the chart even more visual, you can use conditional formats to highlight the cells with the X in them, and track the current date to highlight what's been and what is to come. To do this, highlight all the cells in the block from J2 to BA17 (ie. from the first of the dates themselves to the last cell for the last task). Select 'Cell Value is'; choose 'Equal to' and then X, and set a format for the cell pattern. Click Add and add a second format that is a 'Formula Is' format with the value **=J\$2-TODAY()<=0**. Set a pattern for this and click OK.

Now, you will see that the cells marked with an X are highlighted, so you can trace the path of the tasks. Any cells that relate to dates already past are indicated as such by the colour you selected for the pattern. You can now format the worksheet to make it look more attractive. Because conditional formats are placed in a cell in addition to the regular formats, applying a new format using Format → Cells won't stop the alerts and other conditional formats from doing their job.

This project worksheet is necessarily a simple one. Provided your task is fairly straightforward, and provided you have a good sense of how long each task will take before you begin so you won't be juggling dates a lot (in particular, dates dependant on other tasks being completed), it can help you to plan and track your progress.

Of course, for more complex project management tasks, Microsoft Project is still the tool of choice, but Excel can be made to perform in a pinch.

TOP TIP

Format alternate rows

To format every alternate row a single colour, create a conditional format and configure it to 'Formula Is' and type: **=mod(row(),2)**. Every odd numbered row will be formatted as you describe.

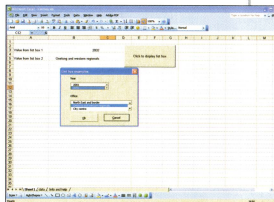
MACROS OF THE MONTH ON THE COVER DISCS

This month's Excel macro of the month is a dialog box that includes two list boxes. Both of these display a selectable list of items. When the user selects an item from either or both of the lists and clicks OK, the values they selected are entered into predetermined cells in the workbook. The two list boxes each get their initial data a different way. The first of them gets its data from an array of values in the macro code itself. The second list box gets its values from a list that appears in the workbook in a sheet called Data (the range from A2:A8 is used for the list values).

This macro and UserForm (a custom dialog form) example is easily adaptable by you. You can replace the array of values in the macro with the values of your choice, and it is a simple process to indicate a different cell for the selections to be placed in. If desired, you can replace the values in A2:A8 with your own. To use less or more values, you can adjust the range referred to by the list box's rowsource property. This solution allows you to serve up a set of different selectable options to your user from which they can select the option of their choice. The file listbox.xls containing the macro is on the cover discs.

The Word macro of the month is a date-checking macro that lets you type a date in dd/mm/yy format into a dialog, and will then tell you whether the date is a day of the week or a weekend day. There are two

ways to run this macro: it can be run from a button in the document itself, or using the Macros dialog. The macro checks to ensure you have typed a date and, if not or if you click the Cancel button, nothing happens and you can continue your work. The datecheck.doc file containing this macro is on the cover discs.



This month's Excel macro of the month is a pair of list boxes that provide data you can select from, and the macro will then enter it into defined cells in the workbook.

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Add style to your site

Helen Bradley shows you how style sheets can give your site a new level of consistency.

You've probably spent hours updating and adding to your site. Some of this time will have been spent making the formatting consistent across all the pages. Cascading Style Sheets (or CSS) were designed to manage much of the work of formatting your site. This month, we look at what style sheets are and how you can use them on your site.

● The basics of CSS

CSS on the Web is a similar tool to styles in a word processor or desktop publishing software. Styles can be used to format text and other elements on your Web page and, when you change a style, all the elements formatted with that style change automatically.

Style definitions can be placed in a number of locations and how they affect your text depends on where they are. Styles can be placed inline, so they're included in the tag for the element itself — this is the less useful option because it is practically as cumbersome as applying different formats to text using tags.

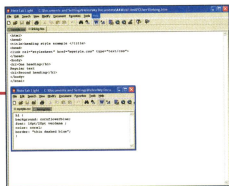
Styles can also be placed in the document head. This is preferable, as a single style can then affect many different elements on the page. A third option is an external style sheet, which is a set of styles included in a document and loaded onto the server. These are then included on the page by reference to the external file.

The way these three types of styles interact is that, in most situations, inline styles take precedence over styles in the document head where their contents are in conflict. Those styles in the document head take precedence over those in an external file where they conflict. However, styles also have a cascading influence; those in an external file that are not altered by a style sheet in the document header or an inline style will still apply to the text or other element on the page. So, for example, you could create a style in the page head and have it apply to the whole document, except for sections that you specifically alter using an inline style.

● The advantages of CSS

Using styles in the document head or an external file removes the formatting of the page from the text. So, to change a page's formatting, you alter the styles in the document head rather than

You can place styles in an external file and then refer to them by linking to them in the head of your Web page.



finding and adjusting formatting tags throughout the page. You can then change all the formatting on your site by altering one file.

● Styles terminology

To see how a style is created, here's one for a level 1 heading:

h1 (font-size: 16 pt; color: cadetblue; text-align: right)

In this style, **h1** is the selector and its usual appearance (which is determined by a browser's rendering of a **h1** tag) is modified by the combination of properties and values that follow it in the style rule.

The style rule assigns various attributes to the **h1** heading tag using a series of property/value pairs. For example, the property **font-size** is given a value of 16 points and the **color** property is given the value **cadetblue**. Each property/value pair is separated from the next by a semicolon (;). A colon (:) is used between a style property and its value. The entire collection of property/value combinations for a selector is enclosed in a set of curly brackets — at least one space separates the selector and the opening bracket. Each style is created in a similar manner.

● Useful style properties

There are many style properties that you can use. Here are some of the most commonly used ones:

color. You can set the value of the **color** property to any named colour (there are 141 of these), or specify the colour using its hexadecimal RGB value.

text-align. Set this to **left**, **right**, **center** or **justify** to align text.

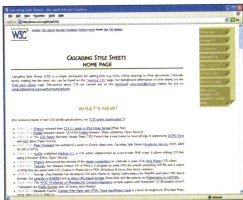
font-family. Set this to the font face name you wish to use. You can specify alternatives so, if the first one isn't available, the second will be used. If neither is available, the browser's default font will be used. Ensure you always use the font's exact name and, if you're unsure, go to Start —> Control Panel —> Fonts and double-click the font's name and read the correct name from the top of the dialog.

background-color. This property is used to configure the background colour of the page when it is included in a body selector. It sets the text background if placed in a text selector such as **h1**.

text-indent. This sets a first-line indent for a paragraph of text, and you can set the value to points (pt), inches (in), centimetres (cm), pixels (px), ems (em) or a percentage.

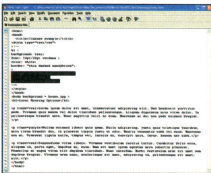
● Configuring styles

All three types of styles are created in a similar way. An inline style affects only the text that is formatted by the tag which contains the style (not other text formatted with the same tag but without the style). The sample below shows the **h1** style with a style attached,



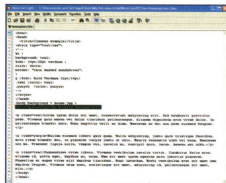
The W3C is the organisation that publishes the CSS standards and its Web site (www.w3.org) is a good source of information.

STEP BY STEP CREATE CLASSES



1 These styles give you two alternative looks for colours used to format body type in your page. The **teal** and **purple** are called class selectors:

```
p {font:Verdana 12pt/14pt }
.teal {color: teal}
.purple {color: purple}
```



2 Place the style declarations into the head of a page or into an external style sheet file. To use the styles in your document, you'll specify the class selectors when you need to use them. The result of this example is alternating coloured paragraphs of Verdana 12/14 point type:

```
<p class=purple>This is a paragraph of text...</p>
<p class=teal>This is a paragraph of text...</p>
<p class=purple>This is a paragraph of text...</p>
```

3 The class selectors **teal** and **purple** are generic, which means they can be applied to any tag that can take a colour value.

So, for example, you can use it to configure the heading tag. This code will make the heading a teal colour:

```
<h1 class=teal>This is a heading </h1>
```

and again without a style. It sets the text background to **cornflowerblue**, the font is **Verdana**, **coral** in colour and a size of **16** points with **20** points of leading (spacing between lines of type). All is surrounded with a small dashed border in **sandybrown** colour:

```
<h1 align=center style="background: cornflowerblue; font: 16pt/20pt
Verdana; color: coral; border: thin dashed sandybrown">This heading line
has a style attached to it.</h1>
<h1>This is a regular heading</h1>
```

As you can see, if you have multiple **h1** headings in the document, and if you want to format them similarly, you'd have to add an inline style to each **h1** tag. This second solution creates a style definition in the document head. It will apply to all **h1** formatted text in the document:

```
<html>
<head>
<title>heading style example </title>
<style type="text/css">
<!--
h1 {
background: cornflowerblue;
font: 16pt/20pt verdana ;
color: coral;
border: "thin dashed sandybrown";
}
-->
</style>
```

```
<body>
<h1>One heading</h1>
Regular text
<h1>Second heading</h1>
</body>
</html>
```

When you place a style definition in the page head, you must place it between a set of **<style>** tags. It is also a good idea to place comments around the style definitions, so that they are left alone by old browsers that aren't CSS compliant.

The third alternative is to create the style sheet as a separate text document with the CSS extension. You can then refer to the text document in the page and, when the page loads, the styles will be included in the page by reference.

Below is a sample CSS file to configure text formatted using the **h1** tag. Simply type it into a text editor and save it as **mystyle.css**:

```
h1 {
background: cornflowerblue;
font: 16pt/20pt verdana ;
color: coral;
border: "thin dashed sandybrown";
}
```

To link to this style sheet from inside a Web page, add this line to the head of the page:

```
<link rel="stylesheet" href="mystyle.css" type="text/css">
```

When the page loads, the style sheet is opened and the styles contained in it are applied to the text. The page source code shows the actual code from the Web page and not the style details, so your actual style definitions will remain hidden from visitors.

Most GUI editors let you configure styles in various ways to format text and other elements on your Web site. Once you understand your alternatives in using styles and why they are used, you will be in a better position to make smart choices when using styles with your Web site. ☺

TOP TIP

Colour me green

To locate the names of the 141 colours that can be specified by name, visit <http://htmlgoodies.earthWeb.com/tutors/colors.html>.

Defrag to speed your PC

Rose Vines answers your most frequently asked PC questions. This month, she explains how to defrag successfully.

Over time, as you delete, move and modify files on your system, those files get broken up into fragments, stored in chunks a little bit here, a little bit there, all over your hard drive — wherever Windows can find a spare bit of space to save the changes. Normally, you won't notice this fragmentation because, to your sluggish

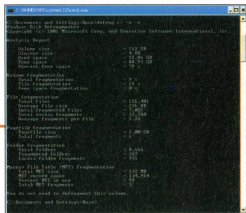
human senses, the computer will appear to retrieve and open each file in a single swoop.

As the number of fragments per file increases, your computer will become slower and slower at opening heavily fragmented files and your system's performance will become noticeably poorer. Because of this, defragging your drives is a housekeeping chore you should perform at regular intervals. Defragging a badly fragmented disk can improve boot time by as much as 30%, and provide similar improvements in file copying and load times.

All versions of Windows come with a tool called Disk Defragmenter, which takes care of the hard work of defragging for you. You'll find it by clicking Start → (All) Programs → Accessories → System Tools. However, to do its job, Disk Defragmenter needs to have the hard drive all to itself. Any other program that makes changes to the drive can upset the process, causing it to start over. With enough interruptions, Disk Defragmenter will loop endlessly and never get the job done.

So, of course, you must stop writing in Word or checking your email. You'll have to stop browsing the Web, too: even though it may not seem to you that the act of browsing causes changes to data on your hard drive, this is exactly what happens. Every page you view gets copied onto your computer and stored — even if only temporarily — in a local cache on your hard disk. In fact, you'll

XP's command line Defrag lets you perform a quick disk analysis.



need to stop doing any work and let Disk Defragmenter do its job in peace.

But that's not all. Simply closing all open programs on your desktop does not mean you've stopped all programs from running. That's because many programs run in the background, in seemingly innocuous fashion. All those icons loaded into the taskbar tray/notification area, for instance, are indicators of programs that have been loaded in the background. Not all of those programs will necessarily cause a hiccup in Disk Defragmenter's operation, but in many cases, that's exactly what they do. Windows also loads its own set of routines and services, and some of these background processes can make Disk Defragmenter stop in its tracks. Even a screensaver can cause Defrag to start over.

There are a number of ways to ensure Defrag runs without interruption; two of the surest are to run Defrag in Safe Mode or clean boot your computer and then run Defrag.

• Safe Mode defragging

To run Defrag in Safe Mode under Windows XP:

1. Reboot your computer.
2. As your computer restarts, it will first display some initial BIOS messages (usually about

memory and system devices). As soon as those messages finish, and before Windows starts loading, tap the F8 key a few times. The Windows Advanced Options menu should appear. Timing is tricky: if Windows itself loads instead of the Advanced Options menu, it means you were a little late in tapping F8. On the other hand, if you get a "keyboard error" message, you probably tapped F8 prematurely. Either way, try rebooting and tapping F8 again.

3. From the Windows Advanced Options menu, select a Safe Mode booting option.
4. When Windows loads, click Start → All Programs → Accessories → System Tools → Disk Defragmenter, and then follow the prompts.

5. Once Defrag has finished, reboot in the usual fashion to start Windows in normal mode.

If you're using Windows 98 or Me, the process is almost identical, but instead of tapping F8 during start up, hold down the F8 key. You'll see a Startup menu from which you can choose the Safe Mode boot option.

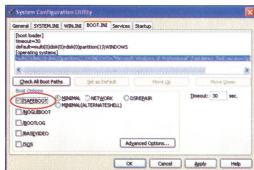
The drawback to using Safe Mode is that it limits your computer's capabilities. Safe Mode is designed to get your computer up and running when something is preventing it from operating normally, so non-

TOP TIP

Make room!

Defrag likes a little elbow room in order to do its job effectively. If a drive is so stuffed with files that less than 15% of its space is free, Defrag will run, but it probably won't do a complete job. It will defragment files to some degree, but still leave fragments scattered across the disk. To check how much space you have available on a drive, open My Computer and click a drive's icon; available space will appear in the task pane. If things look tight, try deleting some files. Use the Disk Cleanup utility to help (Start → (All) Programs → Accessories → System Tools → Disk Cleanup).

GUARANTEED SAFE MODE

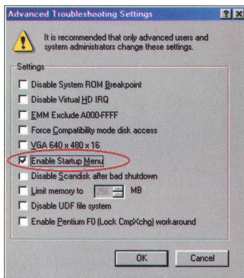


In Windows XP:

1. Close all open programs.
2. Click Start → Run, type **msconfig** in the Open box and click OK.
3. In the System Configuration Utility, click the **BOOT.INI** tab and place a tick beside the 'SAFEBOOT' option and then click OK.
4. When prompted, click Restart to reboot your computer.

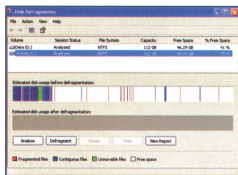
Your computer will automatically restart in Safe Mode. Once Windows loads, run the Disk Defragmenter and then repeat steps 1 to 4 above, but this time remove the tick beside 'SAFEBOOT'.

Safe Mode defragging is usually the simplest option, but getting into the Boot Options Menu by pressing the F8 key sometimes proves absurdly tricky. If you get frustrated trying to F8 into Safe Mode, there's an alternative sure-fire method.



In Windows 98/Me:

1. Close all open programs.
2. Click Start → Run, type **msconfig** in the Open box and click OK.
3. On the General tab of the System Configuration Utility, click the Advanced button.
4. In Advanced Troubleshooting Settings, tick 'Enable Startup Menu' and click OK. This forces the Startup menu to be displayed when you reboot. Once you've rebooted and defragged, repeat steps 1 to 4 above, but untick 'Enable Startup Menu'.



Running Disk Defragmenter can make a marked improvement in the performance of your system.

essential drivers and hardware aren't loaded in Safe Mode, and some functions, such as installing new programs, are forbidden. If all you want to do is let your computer run Defrag and then reboot, the Safe Mode option is sure and sweet. But if you want to have more flexibility, you should clean boot your system instead.

● Clean boot defragging

Clean booting prevents background programs from loading, but doesn't limit your system's functionality otherwise.

To clean boot Windows XP:

1. Click Start → Run, type **msconfig** in the Open box and click OK to open the System

Configuration Utility.

2. On the General tab, click 'Selective Startup' and remove the ticks beside 'Process system.ini file', 'Process win.ini file' and 'Load Startup items'.
3. On the Services tab, tick 'Hide all Microsoft Services' and then click 'Disable all'.
4. Click OK and, when prompted, click Restart.

Windows will reboot and you can now run Disk Defragmenter. Once it's finished, rerun **msconfig** and, on the General tab, click 'Normal Startup', then click OK and reboot.

To clean boot Windows Me:

1. Click Start → Run, type **msconfig** in the Open box and click OK.

2. On the General tab, click 'Selective Startup' and remove the ticks from all the checkboxes.
3. On the Startup tab, tick 'StateMgr'.
4. Click OK and restart your computer.

To return to normal mode after defragging your drive, use the same method as for Windows XP.

In Windows 98, the process is the same as in Windows Me, except you skip step 3.

● Defrag from the command line

In Windows XP, you can run Defrag from the command line. This method gives you additional options and is useful if you want to run Defrag from a batch file. To use the command line mode:

1. Click Start → Run, type **cmd** and click OK to open a Command window.
2. Type **defrag /?** and press Enter to see a list of command line options.

Some examples include **defrag d: -a -v** (where **d:** is the letter of the drive you wish to check) to see at a glance

TOP TIP

Defragging alternatives

Windows' Disk Defragmenter does its job, but it's not the smartest of programs. If you'd like more power, more flexibility and faster defragging, I recommend you try a third-party defragging utility. My picks are Diskeeper 9 (www.defragmentation.com) and PerfectDisk 7 (www.raxco.com). Each of these is stuffed with options and lets you continue working while it does its magic. Windows' own Disk Defragmenter is a cut-down version of an earlier release of Diskeeper. You'll find 30-day trial versions of these programs on their respective Web sites.

whether a drive requires defragging and get complete statistics on drive fragmentation.

Type **defrag d: -f** to force Defrag to run, even if there's not much free space available for defragging (this may result in a very slow defrag). ☹

Your technical problems solved

OFFICE APPLICATIONS

Help Station's heavyweights will knock out your PC problems.

Excel lookups

Q I need to look up a value in the first column of an Excel array. The value will be near, but not exactly the same as the lookup value. I have currently tried **VLOOKUP** and the **INDEX/MATCH** combination, without

success. The lookup value is rounded to seven decimals and the array values are also rounded to seven decimals. Because of the type of calculations and formulas, I cannot re-sort the array into ascending or descending order, as it creates calculation errors (either N/A or Value). The lookup value does not have to be a perfect match for the value found (within a couple of decimals is acceptable). I need the seven decimal places to differentiate between some near values in the array.

— Peter Gall

A There are a few problems I see in what you're trying to do. First of all, you have encountered difficulties with the **INDEX/MATCH** and **VLOOKUP** functions, both of which require either an exact match or the data to be sorted in order, so that the nearest (but not the largest) value is returned. If you can't sort your data and if you don't want an exact match, then neither of these solutions is for you. In addition, Excel can't perform a 'nearest' match. It requires you to use either an exact match or the 'next nearest but not larger' value, so you'll be stuck with one of these.

If you can't sort your values, what you can do is copy them (by selecting them and clicking Edit → Copy) and then paste the values themselves into a second sheet in the workbook using Edit → Paste Special → Values. You can then sort your list of values, perform your lookup and obtain the 'next nearest but not larger' value. If desired, you can then look up

In Outlook, you can configure different signatures to be used when sending email from different accounts.

this value in the original table to locate the desired answer.

The other alternative is to write a macro that takes your value and compares it, one value at a time, against the value stored in each cell in the array. The macro should calculate the difference between your value and the current list value, and compare it to the smallest difference obtained so far (use the absolute of the difference because you will be ignoring negative values to find the nearest value). If the current list value is the nearest so far, store the number and the current smallest difference, and continue on to the next value and check it. Once you're done, you will have the value of the nearest value to the one you are interested in. If you need the location of this value, you can now look it up in the array because you can look for an exact match. Alternatively, store the position of the nearest value so far in the array with the nearest value as you process the list. This way, you can locate the position using a simple formula later on.

— Helen Bradley

Multiple email accounts

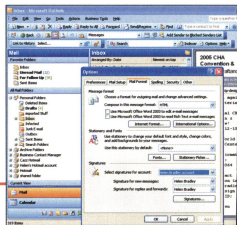
Q Is it possible to maintain a number of identities within Outlook? That is, use one email program, but have emails get sent out under the appropriate identity. For example, let's say

I'm secretary of the local cat club and I keep an email address of catclub99@yahoo.com and also have my own email of jill_walker99@yahoo.com. Can I set Outlook to pick up mail from both accounts? And then, when I reply to either, I want the appropriate identity and email address to be used. In other words, even if I forget, Outlook won't. And just to be greedy, can I have Outlook also insert the correct signature?

— Jill Walker

A Outlook can manage data for different identities, but that's probably not what you need. You're the same person (not multiple people) and what you need is to manage multiple email accounts from the one program. Outlook 2003 (and I believe 2002) can do this very easily.

1. Set up an account for each of your email addresses. I assume you are using Yahoo's POP3 email option, so go ahead and click Tools → E-mail Accounts → Add A New E-mail Account, and set up an account for each of your email addresses, complete with incoming and outgoing server details for each of them.
2. Create rules for handling the incoming mail. All mail lands in your inbox by default, and you will want the mail coming in to be sorted according to whether it is your personal email or club email. To do this, go to Tools →



HELP STATION

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Rules and Alerts → New Rule. Choose the 'Start from a blank rule' option and work through the steps. For each account, you will need a rule that moves the email from that account, as it is received, into a folder for that account — you can set up the folders as you create the rule.

From now on, incoming email will be automatically sorted into the appropriate folder, depending on the account through which it was received.

To create signatures for each account, go to Tools → Options → Mail Format → Signatures. You can set up a signature to be used for all new mail and replies on the basis of the account used to send the message. So, set up a signature for your club account and one for your personal account.

This situation covers the replies, as they will be automatically routed via the account that received the original message. So, if you're replying to a club email, the email will go out using the club mail account and with the appropriate signature.

For new messages, you must choose the account and the signature to be used, if they are to be different from those configured for your default email account.

— Helen Bradley

Extracting unique values

Q Using any spreadsheet or database, how can I merge several phone lists and address books without encountering duplicate names? Like most people, I have a growing list of email addresses as well as a list of numbers in my fax machine and a telexed. Most of the names in each of these three lists are the same. Some of the phone numbers are slightly different because the area code is included. I have tried to merge or combine these lists in recent versions of Lotus 123, Excel and Microsoft Access, without success. At best, I simply get several entries for the same name. I think a macro might get me there. For example, I would want one that says something like: 'If row 2

of the Name column is the same as the previous, ADD the contents of row 2 to row 1 and then RUN the macro called [ERASE ROW].'

I have not had success running a macro or script from the formula bar. Can it be done? This seems to be such a simple and common need, yet I cannot work it out. When you tell me how simple the solution is, I will be so embarrassed. Please embarrass me.

— Ray Tierney

A Actually Ray, I won't embarrass you, as this is not an easy task. Here's what I would try.

1. Assemble all the data from your address books into a single Excel file. You want the data that is indicative of a duplicated entry (the name) in a single column. From your question, I assume this is possible. Make sure you perform this on a copy of your data, not the original.
2. Sort the data using the Name column.
3. Place a formula like this in the first blank cell in the data (I'm assuming E1 is blank): `=IF(SA1=SA2,E2,"")`. This formula compares the value in the name cell in the current line with the one in the next lower line; if they're the same, it puts the value from the cell below into the current cell.
4. Copy this formula (don't type it, copy it) and paste it into every blank cell in your data. You can find these by choosing Edit → Go To → Special, clicking Blanks, and then pressing Shift-Insert to paste the formula into all blank cells in the selected range. This will force Excel to percolate up the data, filling the first row of data for a particular person with the data from rows below, where there are blanks in that person's information.
5. Select all the cells and go to Edit → Copy and then Edit → Paste Special → Values. This converts the results of the IF function into values.
6. Move to the first duplicate row, select the entire row and



BOOK REVIEW

Google: Top 100 Simplified Tips & Tricks

This is a great resource for those who are new to Google, or those who want to do more than a simple search. The book contains 10 chapters, each with 10 different tasks, and each chapter features a title page that lists the difficulty level of each search technique. It is very easy to follow, and each technique is broken down into steps with accompanying screenshots. Additional tips are also included to provide further information and other tricks to try. Topics covered include Google's search options, searching for particular file types, adding Google tools to your browser, using Google's reference tools, reading and posting in discussion forums, and more. While it's not as advanced as *Google Hacks* (see review on page 115), it's a fantastic way to learn more about Google and its tools.

— Olga Jevdic

Price: \$33.95 **Contact:** John Wiley & Sons **Phone:** 1800 777 474 **Web:** www.johnwiley.com.au

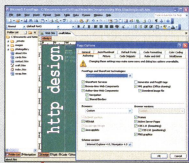
FRONTPAGE 2003 SCRIPT

Q I am building a new Web site from scratch in FrontPage 2003. Whenever I want to use the DHTML feature on some text, I receive this message: "Warning: this page contains script(s) that could cause errors when run with the dynamic animation scripts". If I design a new Web site using and customizing an existing template, there is no such problem. I suspect the problem is that I'm using the newer interactive navigation buttons included with FrontPage 2003, because if I delete these, I can apply DHTML effects to the text without any errors.

— Rand Blade

A There are a couple of things you can try. First, go to Tools → Page Options → Authoring tab and make sure you have ticked the checkboxes for both CSS 1.0 and 2.0. Next, ensure that your navigation buttons and the text are created inside tags, as this is a requirement for DHTML.

— Helen Bradley



Create navigation buttons inside tags when using DHTML.

go to Edit → Delete → Entire Row and click OK.

7. Provided you don't do anything else, you can move down the worksheet and press F4 (the 'repeat last command' key) to remove each row you don't need. At the same time, you can perform a visual check that everything is in order; don't remove anything that looks incorrect — leave it to check the data later on against the original data.

— Helen Bradley

HARDWARE

Wireless workings

Q Could you explain how a wireless mouse works?
— V. Gurkan

A Any computer mouse works by sending signals to the computer. The basic mouse sends pulses to indicate each increment of movement in the X and Y (horizontal and vertical) axes. These small movements are known as 'Mickey's'. The other signals that are sent from the mouse are for the buttons, scroll wheel(s) and so on.

In older days, the mouse was connected to the PC via the PC's serial port; that later changed to a dedicated PS/2 mouse port, and these days it's usually via a USB port.

Wireless mice simply use some sort of wireless technology to replace the electrical cord that goes between the mouse and the PC. This involves a transmitter in the mouse and a receiver attached to the port of the PC. Or, alternately, the receiver can be one that's already built into the PC, such as Bluetooth. The link can also be infra-red (less common nowadays) or radio (most common). It could even theoretically be ultrasonic, I guess, but that would probably annoy the family dog.

Some wireless mice are keyed to the receiver, making them immune from spurious signals, which is an important capability in an office or classroom situation.

The main disadvantage of any wireless mouse is that it needs an internal battery to power it. Not only does this add weight, but it's one more thing to buy (in the case of alkaline batteries) or recharge, and it means your mouse may go inactive just when you really need it. In order to circumvent this, some wireless mice are designed to sit in a charging cradle when not in use.

Theoretically, you could have a wireless mouse that

didn't need a battery, but I don't know of any on the market.

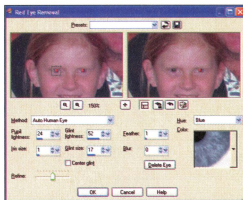
Another disadvantage is that some wireless mice have problems such as a slight lag in operation.

Wireless mice are a personal thing. I can't see the point in using one on my desktop PC, but if I had a media centre PC in the lounge room, then a wireless mouse and keyboard would be the only way to go. You can also get excellent tiny wireless mice, with a receiver that plugs into a vacant USB port, which are perfect for notebook computers.
— Paul Zucker

Why do I get red-eye?

Q We bought a new digital camera for Christmas, but we're disappointed with the pictures. Many of the indoor shots have red-eye, yet the outdoor shots don't. Why is this and what can we do about it?
— Rene O'Neil

A Red-eye is caused when the flash is so close to the lens that the light reflects from the back of the subject's eye. It's a bit like the green-eye effect you get from some animals when your car headlights light them up at night. Professional photographers avoid red-eye by having the flash gun off the lens axis (at least 100mm from the lens, and preferably much



more), by bouncing the flash off something such as a white ceiling, or by diffusing the flash through something. It's possible to do these things with some digital cameras by purchasing an external flash unit, although these can be expensive. You'd really need to be serious about your photography to get one.

Most modern cameras use something called 'red-eye reduction', which is supposed to work by closing the eye's iris just before the photo is taken. This is either triggered by a few pre-flashes of the flashgun, or by the shining of a red LED. Neither is particularly effective, but you should at least make sure they're turned on to check whether they work. You can also avoid red-eye by having the subject not look directly at the lens — get them to lower their eyes a little or focus them a little to the left or right of you and the camera.

Note that almost all photo editing packages these days have a red-eye removal function, which can resurrect an otherwise unusable photo.
— Paul Zucker

Most graphics and photo editing programs have a tool for eliminating red-eye.

Why such big ATA/100 drives?

Q Since ATA/100 has a drive capacity limit of 137GB, why are there 160GB — and bigger — ATA/100 hard drives around? Or does this limitation only apply to each partition?
— William Xian

A They exist because this limitation has largely been circumvented in newer hardware and software.

You haven't mentioned which version of Windows you use, but Service Pack 3 for Windows 2000 and Service Pack 1 for Windows XP overcame the size limitation.

Of course, the operating system update will only benefit you if your motherboard's system BIOS is capable of the 48-bit addressing, which allows drives of over 137GB to be installed. Check your motherboard manufacturer's Web site for BIOS updates that might enable the feature. Some motherboards capable of the feature are shipped without it enabled initially.

If your system is an older one, in which the system BIOS does not provide 48-bit addressing for IDE drives, then you have two choices available to you.

- Purchase an add-in IDE controller card, which provides 48-bit addressing.
 - Download and use the installation utilities available from the drive manufacturer's Web site support section. Such utilities act as an 'overlay', which enables the large drive support.
- Terry O'Shanassy

DO I NEED AN IPOD PHOTO?

Q I bought a 40GB Apple iPod last year and no sooner had I bought it than Apple introduced a new version of the iPod. Now my model has been reduced in price and there's something called an iPod Photo. What does the iPod Photo do that mine won't?
— Bronwyn Anne

A Unlike the regular iPod, the iPod Photo has a colour screen. It also allows you to store photos as well music. Your images can therefore be viewed on the colour LCD, or you can output them to a TV or screen through the AV cable. The colour screen is a tiny 220 by 176 pixels, so I wouldn't get too worked up about missing out on it.

— Darren Yates

Best photo multifunction printer?

Q I'd like to buy an inkjet multifunction printer for around \$400. I don't really need a fax machine, though. I want to be able to print good quality photo prints from a digital camera. I've been told that Epson printers are good but costly, and that Lexmark is quite good but cheap. Which is the best for my price range? — Chantal Janvrin



A I'd actually recommend the two brands you didn't mention: Canon and HP.

Epson printers have the print head built into the printer, so if it gets clogged, it can't be removed and you'll need to send it back to Epson to fix. Epson's user cleaning system involves pushing ink through the head to flush out impurities, but it uses up a fair amount of ink.

While Lexmark has improved, I've not been all that impressed by recent review samples I've tested. What's more, they are comparatively expensive to run.

HP produces beautiful prints — just excellent — but I wish someone at HP would wake up and deliver consumers

individual ink tanks instead of the tri-colour cartridge fiasco the company has had since the DeskJet 500.

At the moment, I think Canon offers the best all-round package: excellent cost-effective printing with removable print heads, and individual ink tanks on many of their models.

Still, I wouldn't recommend any of the multifunction units; not for lack of quality, but simply because the ink tanks are just too small.

Given that you want to print photos, I'd go for Canon's PIXMA iP3000 printer. It connects directly to any PictBridge-compatible camera and typically sells for about \$225. I know that's well under

your \$400 margin, but take a look at what this printer can do before you decide it's no good for you. I can't see the reason to spend more, given your requirements.

— Darren Yates

Shattering CDs

Q CDs have shattered in my CD burner twice, damaging my IDE connector on the mainboard, which also damaged the DVD drive connected to it. I'm afraid it might damage my graphics card, a GeForce FX 5950 Ultra, which has a connection to the DVD drive. Why do CDs shatter in my drives? — Keith Galway

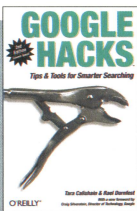
A CD shatter is one of the more bizarre ways of killing PC components I've heard about, but I've not actually seen it happen yet.

A possible cause is that a drive spindle motor gets out of alignment and the disc starts wobbling about all over the place. The more likely explanation is that the disc itself is not balanced, gets out of whack or hits something inside the drive.

That aside, why does your graphics card have a connection to the DVD drive? This makes no sense at all and there's no reason, other than possibly sharing the power connector, for you to do this.

The bottom line is that your graphics card should be fine and, if you have two optical drives, the one that didn't have

Looking for a great photo printer? Consider the Canon PIXMA iP3000.



BOOK REVIEW

GOOGLE HACKS

This second edition of the *Google Hacks* book discloses 100 techniques for getting more out of Google. Although a few of the hacks are slightly out of date (such as how to defeat Google's 10-word search limit — the limit has since been raised to 32 words), most are excellent shortcuts and tweaks (many to do with choosing the correct special syntax for a job) that will help researchers and data miners extract more precise information from the Web. The topics covered are widely varied, from tracking stocks, seeking out Weblog commentary, finding recipes and there are even specialised sections on image searches, Google News, Google Groups and even Gmail. All up, this is a very handy reference for search aficionados.

— Dan Gardiner

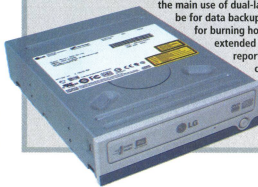
Price: \$49.95 Contact: Woodslane Phone: (02) 9970 5111 Web: www.woodslane.com.au

DUAL-LAYER COMPATIBILITY

Q What's the story with dual-layer DVDs and recorders? Are the discs they write compatible between machines? — Mick Harwell

A Until recently, most DVD recordable drives have only been able to burn single-layer DVD-R or DVD+R discs with a maximum capacity of 4.7GB. New dual-layer DVD writers can record double-layer DVD+R discs with capacities of up to 8.5GB. This makes it theoretically easier to create backups of commercial DVD movies that are mastered as dual layer. In reality, copy protection and, of course, applicable copyright law, would suggest the main use of dual-layer drives will be for data backups or, more likely, for burning home movies and extended TV series. Initial reports suggest that compatibility between different dual-layer writers is problematic.

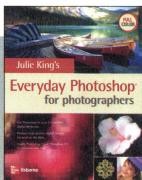
— John Hilvert



the disc explode in it should be fine. As for the other drive, I'd dig a hole in the backyard and bury it. You might also want to keep an eye on your discs, especially if you buy cheap ones. Before you put a disc in the drive, inspect it for slight hairline cracks, particularly around the central hole.

— Darren Yates

WINDOWS



BOOK REVIEW

Julie King's Everyday Photoshop for Photographers

You don't have to be a professional photographer to get great value out of this simple yet informative guide to the world's most popular photo editing tool. If your Photoshop skills lie anywhere from beginner to intermediate, this book will help you get your head around the program's many features. One of the biggest challenges when learning Photoshop is coming to grips with complex concepts: histograms and tone curves, channels and masks. You'll understand these concepts by following practical examples. The book is littered with colour-coded time-saver tips and warnings, making important information easy to spot at a glance. Doing justice to the nature of its content, the book is full colour and printed on glossy paper. To top things off, the clean, open layout makes it a pleasure to read.

— Anna Raciti

Price: \$59.95
Contact: McGraw-Hill
Phone: (02) 9900 1800
Web: www.mcgraw-hill.com

If AutoPlay stops working, it's easy to re-enable it.

Resurrecting AutoPlay

Q When I put a CD into my Windows XP Home PC, it doesn't automatically play, as it used to. How do I re-enable this feature?

— Brian Carpenter

A The feature you're referring to is known as AutoPlay, and it's fairly simple to re-enable it if it has been turned off.

1. Open My Computer.
2. Under 'Devices with removable storage', right-click the device and select Properties.
3. Click the AutoPlay tab and select the multimedia content type you want to set to autorun.
4. Under Actions, click the action you want Windows to perform when it detects the media type you selected.

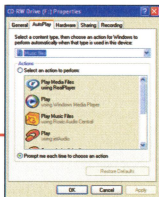
As an aside, if in step 2 you can't see the heading 'Devices with removable storage', here's how to have My Computer display its contents in groups.

1. Open My Computer.
2. Right-click in an empty space in the window and select View → Show in Groups.
3. Right-click in an empty space once more and select Arrange icons by → Type.

— Jan Wikström & Rose Vines

Duplicate My Documents?

Q I recently upgraded from Windows Me to XP Pro. When rebuilding My



Documents with data and pictures, I noticed that all the info was duplicated under 'Administrator'. Isn't this just using my 80GB drive? How can I stop it?

— Larry Jones

A Are you looking at My Recent Files, which is a per-user item and lists all the files you have dealt with recently? If so, you will find that the files are only shortcuts (right-click on the filename and select Properties to check) at one kilobyte each. They aren't really duplicates on the hard disk.

— Jan Wikström

Grouping windows

Q I like the way Windows XP makes all my Internet Explorer windows group together on the taskbar. Can I make all the other programs do that, too? For example, have them in a group when there are a few open windows for the same program?

— Daniel Wellington

A Yes, there certainly is a way to do that, and all it takes is a straightforward change to the Windows Registry.

Before I describe the procedure, let me clarify a thing or two, and offer some other

suggestions because you haven't quite 'got it right' about how Windows XP behaves with regard to taskbar grouping.

First, Windows already groups multiple instances of similar programs — the feature isn't restricted to Internet Explorer. I suspect IE is simply the program you use that ends up with the most open Windows, and that you seldom have many instances of a different program running simultaneously.

In its default installation configuration, Windows XP groups taskbar buttons when there are so many program windows open that the buttons themselves become smaller than a set size. When it performs the grouping, multiple windows of the program you opened first are grouped first, then multiple windows of the next program, and so on. The grouping continues until you close enough windows that the taskbar buttons become large enough to exceed the set size limit again.

Here's how to switch this grouping feature on or off.

1. Right-click the Start button and select Properties.
2. On the Taskbar tab, tick or untick the 'Group similar taskbar buttons' options, as desired.

As I indicated earlier, changing the grouping

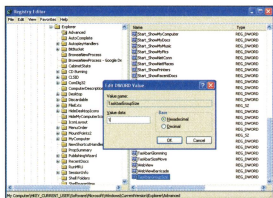
OFFICE Q&A MULTINATIONAL EXCEL

Q I am an Australian living in Indonesia, and locally, the numbering format is the reverse of what it is in Australia. So, for example, '\$10,346.98' in Australia becomes '\$10.346,98'; that is, the symbols for thousands and decimals are reversed. My computer is set up with Indonesian Regional settings for numbering, so spreadsheets I produce in Excel are appropriate for the organisation I help. The problem arises in that many of these documents then need to be copied into Word, along with text describing the data, and sent to Australia. At the moment, I spend a lot of time changing the commas and decimals to Australian format by using Find and Replace. Is there an easier way?

— Rob Floyd

A I think there is an easier way. Whenever you need to copy the worksheets to Word, click Start → Control Panel → 'Regional and Language settings' and configure the settings for Australia. You should find that when you open your Excel worksheets, they are formatted correctly for Australia. Do what you need to do to copy the data to Word, and then return to the Control Panel and reset the options for Indonesian settings.

— Helen Bradley



A Registry edit lets you adjust how buttons are grouped on the taskbar.

characteristics is only one way to address the issue. I'm a little amazed you actually like the feature. Many people don't, including myself, and so I offer this alternative approach.

Unless your monitor is only a small one, and restricted to using a low screen resolution, you could simply increase the size of the taskbar. Make it use two or three lines, so that more taskbar buttons can fit on it before they become too small. This approach is particularly suitable where the screen resolution you use is 1,024 by 768, 1,280 by 1,024 or 1,600 by 1,200, for example. To do this:

1. Right-click an empty area on the taskbar and make sure 'Lock the taskbar' option is unticked.
2. Move the mouse pointer over the upper edge of the taskbar.

3. When the mouse pointer changes to a double-headed arrow, click and drag the top edge of the taskbar upwards to make it bigger.

4. Right-click the taskbar and tick 'Lock the taskbar'.

If you'd still rather use the taskbar groupings, there's unfortunately no way to pick a number and have the taskbar buttons group when that number of windows is reached. As indicated above, grouping generally occurs when taskbar button size drops below a set level. What you can do is:

- Group the buttons by age, as per the default settings.
- Group the buttons by size. The programs with the most windows open will group first.
- Group the buttons as soon as two windows are open for a program.
- Group the buttons as soon

OFFICE Q&A / SOUND ON ENTRY

Q I am receiving external numeric data via my computer's serial port, with the data then funnelled into Excel. The data is automatically entered into the current cell and then the active cell moves to the next row. I would like Excel to give an audible sound when it has received data and moved onto the next cell. I would like to write a macro to take serial or keyboard input, enter it, move on and then make a distinct sound.

— Jack Scukovic

A I assume you already have a program that grabs the data from the computer's serial port (also known as the RS232) and puts it into an Excel worksheet. If not, then you need to obtain one, as the process is far more complex than can be covered in a Q&A format like this. There are many solutions available and you can search for them on the Internet using a search engine. One such program is available from Windmill Software in the UK (www.windmill.co.uk/serial232.html).

More than likely, though, is that the hardware attached to your serial port to transfer the data will have shipped with some software to manage the situation; if not, perhaps you should contact the supplier to discuss this issue.

OFFICE Q&A **LOST CD KEY**

Q I have Office XP Professional on my PC and prior to changing from Windows 98 Second Edition, I had Microsoft Publisher 95 on the hard disk. When the unit was upgraded to Windows XP and Office XP, Microsoft Publisher was removed, as I didn't think I'd need it any more. I now find a need to reinstall it, but I have lost the CD key. I have the numbers from around the centre hole of the CD (CDRM-1335310 2), but that doesn't work. Is there any way in which I can obtain or recover the product ID? There is no trace of Publisher in the Registry.

— Dave Mills

A You can try phoning Microsoft Australia to see if it can help. The technical support phone number is 13 20 58 and the technical support fax is (02) 9023 5021. If this fails, I suggest you crank up your favourite search engine and type into it this search phrase: **missing "Microsoft Publisher 95" cd key**.

— Helen Bradley

as three windows are open
for a program.

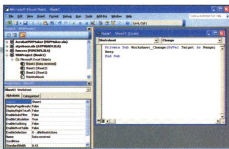
If you'd like to do any of these, you'll need to edit the Registry (something you shouldn't do if you don't understand the risks involved).

1. Click Start → Run, type **regedit** and click OK.
2. Navigate to: HKEY_CURRENT_USER\Software\Microsoft\Windows\CurrentVersion\Explorer\Advanced
3. Right-click in the right-hand pane and select New →

4. Name the new value **TaskbarGroupSize**.
5. Double-click the newly created key and set its value as follows:

- 0** — Group by age with the oldest group first.
- 1** — Group by size with the largest group first.
- 2** — Group any group of size 2 or more.
- 3** — Group any group of size 3 or more.

Close Registry Editor and log off and then back on for the change to take effect.

—Terry O'Shanassy 

That leaves the need for an Excel solution to the problem of knowing when data has been entered. This can be done using a macro.

1. Open the worksheet
in question and go to Tools → Macro → Visual Basic Editor and, in the Project area, locate the actual worksheet that will accept the data — you must attach the macro to the actual sheet itself. Double-click the sheet name to open the code for that sheet.
2. Type this macro into the code box:

```
Private Sub Worksheet_Change(ByVal Target As Range)  
Beep  
End Sub
```
3. Return to Excel and save the worksheet.

Whenever the contents of a cell alter because new data has been entered into it (rather than a calculation resulting in a new value), Excel will beep.

— Helen Bradley

Make calls using the Net

Paul Zucker explains how engin's Softphone Xpro works.

Based in Australia, engin is a VoIP (Voice over Internet Protocol) phone company. It provides a full-featured telephone system that uses the Internet to connect you to other phone users anywhere in the world. These phones can be normal landline phones, mobiles, or other VoIP phones.

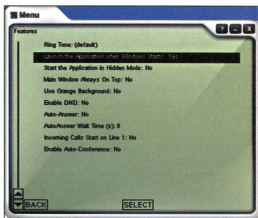
By loading the Softphone Xpro software onto your PC or notebook, it becomes a telephone that allows you to make inexpensive local and

international phone calls, and free calls to other engin users.

Softphone Xpro is designed to be loaded when your PC boots. That way, whenever your PC is on, so is your phone. Not only can you make and receive calls, but you get more phone features than you'd ever imagined possible. For a start, if you're already talking on the phone, or aren't able to take a call, the engin voicemail takes your call for you, and if you like, will automatically deliver it as an email with an attached audio voicemail.

The Softphone Xpro service normally costs \$9.95 a month

engin's Softphone Xpro lets you make phone calls using your PC's Internet connection.



It's a good idea to ensure Softphone is set to load on startup. This way, you'll be sure to get all incoming calls.

(about a third of the cost of renting a Telstra phone line), but this special offer for *PC User* readers gives you a free 90-day account. All you have to pay for is the cost of your calls. When the three-month period is up, you can continue the service at \$9.95 a month.

With engin, you get a real telephone number that can go in the White Pages telephone book. Call costs are 10 cents for untimed local calls, 30 cents for calls to mobiles and as low as 5 cents per minute for international calls, depending on the country. Timed calls are billed for the first minute, and then on a per-second basis. If you are in the main capital cities, calls to other main cities are 10 cents untimed.

Installing the software

You will probably want to set Softphone Xpro to launch at startup, so that it's always available to take and make calls. Once installed, you will have to call engin on 1300 305 000 to activate the service and get your phone number.

The first time you run the software, it will take you through an audio tuning wizard, which makes sure your sound is working properly and sets the levels. Although you can use

the phone with your normal PC speakers and a microphone, this will cause an echo at the other end because the microphone will pick up the other voice and send it back with a delay. A much better solution is to use a headset which plugs into the speaker and microphone sockets on your sound card, or sometimes on the speakers (see the article on page 123 for details on headsets and microphones). An even better way is to use a USB phone. These devices plug into a USB port and work just like a normal phone, complete with a dialling screen, keypad and a ringer.

The one thing to get used to with VoIP is the delay. All calls will have a slight delay, similar to making an overseas call. However, unless you have a poor Internet connection, or are using dialup, this probably won't be noticeable. In use, Softphone appears on the screen as a fancy phone handset, and all you have to do is click the appropriate buttons with your mouse.

SPECIAL UPGRADE OFFER

Thanks to engin, *PC User* readers can trial the engin Xpro service free for three months, normally \$9.95 per month. Normal call charges still apply. To take advantage of this exclusive offer, call engin Customer Care on 1300 305 000 and quote the coupon code 'eng56'. Offer ends May 31, 2005, so be quick. See the cover discs for full terms and conditions.

Keep your calls under control

Monitor your calls with CallerID Monitor 1.5. Paul Zucker explains how.

Caller ID, also known as CND (Calling Number Display) or CLI (Calling Line Identification), is a service offered by phone companies around the world. As calls are routed around the world, the number of the caller is sent with the call, and can be viewed by the person being called, even before they answer the phone.

In Australia, CND is available from most carriers, often automatically and free. If you have a Telstra fixed line, you can get CND for a \$6 monthly fee.

If you have CND available on your fixed-line phone, it is delivered as a short burst of 1,200 baud modem tones, between the first and second rings. That way, the equipment can know that a call is coming in, and be ready to decode the

signals and display it on the phone or a separate CND box.

However, there is another way to detect and decode the CND information: via a modem. If you don't use your modem for Internet access any more, it can turn your PC into a full-featured phone, answering machine and so on. And now, with software such as CallerID Monitor, you can see who is calling you (and screen your calls if necessary).

Not only that, but you can use the modem and software on a Windows XP Media Center Edition PC and when the home phone rings, have the caller's number flash up on the screen.

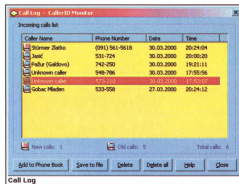
CallerID Monitor also allows

you to store phone numbers in your PC phone book, so you can also display the caller's name onscreen. Want more? Upgrade to version 2.0 and you can even have the caller's picture or some other sort of message come up onscreen.

As an aside, it is important to note that a caller ID is automatically sent with all telephone calls made in Australia unless the caller has a 'silent' number, or has turned it off or uses the override code before each call. However, caller ID information is *always* sent to 000 emergency services, and to people who use a TTY device (deaf people can use this device to send text messages over a phone line). For more information, contact Telstra or your phone company (or check on their Web page).

Installing the software

The software can be run on just



CallerID Monitor keeps a log of all incoming calls, so even if you're not at your PC you can see who called.

If you have a caller's number in your Address Book or Outlook Contacts database, CallerID Monitor can display the caller's name in addition to their number.



You can customise the look of CallerID Monitor to suit your tastes.

SPECIAL UPGRADE OFFER

PC User readers can upgrade to CallerID Monitor 2.0 for \$US15.96 (normally \$US19.95) until the end of October 1, 2005. Version 2.0 supports images, so you can set up the program to display an image of the person calling.

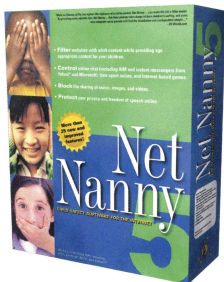
To upgrade to go www.regnow.com/softsell/nph-softsell.cgi?item=5252-1 and enter the coupon code 'PCDD-85XC-USER' to receive the 20% discount.

PC USER

Net Nanny 5

Protect your children & your privacy online

Net Nanny, the world's leading parental control software, gives you control over what comes in and out of your home through your Internet connection, while respecting your personal values and beliefs. Net Nanny 5 is easier to install and configure than any similar product.



- Fully viewable and editable database of Internet sites (URLs), keywords, and Internet-enabled applications.
- Works with all major ISPs, including AOL, Earthlink, MSN, Yahoo!
- Filter websites with adult content while providing age-appropriate content for your children.
- Control online chat (including AIM and Instant Messengers from Yahoo! and Microsoft), time spent online, and internet-based games.
- Block file sharing of music, images, and videos.
- Protect your privacy and freedom of speech online.

rrp: \$89.95

Distributed in Australia and new Zealand by



Tel (07) 3331 5999

Available from Harvey Norman, Officeworks, Dick Smiths, & other leading software stores.

Goodbye spyware

Ensure your system is spyware and adware-free. Helen Bradley shows you how to set up and use Spyware Doctor 3.0.

Spyware and adware are not only a nuisance, but they can also compromise your security as you surf the Web. Some of these malicious programs (often collectively called malware) make their presence known by altering your browser search page or home page in such a way that it is nearly impossible for you to restore them back to the original settings. Other programs perform their deeds in secret, so you don't

know that they are tracking all your keystrokes or the Web sites you visit. Spyware removal software is a vital tool in ensuring your computer, data and personal information is secure when surfing the Web. Spyware Doctor will help you locate and eliminate these problems on your computer.

Once you've installed Spyware Doctor, the program will automatically start and run a full scan of your computer when it launches, if you leave the default options selected. This can take some time, so if you're unable to leave it running, click the 'Stop Scan' button. Any problem files located to date will be displayed in the dialog. You can identify the name of the program that has been recognised and the level of threat it represents. The indicator shows this level: red is high, yellow medium and blue-green is low.

To learn more about any of

these programs, double-click on its entry in the list and a dialog will open with an explanation of the threat, how it works and what it does. You will not be able to actually remove any of these threats until you register the software. Do this by visiting www.pctools.com/spyware-doctor/free/pcuserau/ and following the instructions.

Once you are registered, you can remove the spyware you've found. To do this, click the checkbox for those programs to remove, or click 'Check All' to select them all. Click the 'Fix Checked' option to remove the programs and all traces of them in the Registry. It may be necessary to reboot your computer after this has been done, and it might not be possible to remove all infections, particularly if one is currently running in memory.

You can also set Spyware Doctor to scan and search for updates at regular intervals, so you don't have to remember to do this. From the main screen, click the OnGuard button and click Scheduler—> Summary tab. This lists the settings for the update service. You can change

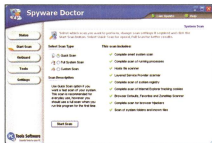
UPGRADE OFFER

Upgrade to the latest version of **Spyware Doctor** by September 2, 2005 and save 20% off the retail price. Normally sold for \$US29.95, **PC User** readers can purchase the software for only \$US23.95. You also get a one-year subscription, which gives you Live Updates and free one-on-one online support.

any of these by clicking the tab for that service, then activating it and setting the time frame for running it. When you're done, click 'Apply changes'.

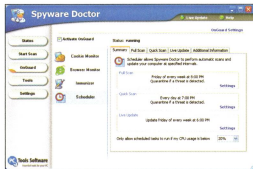
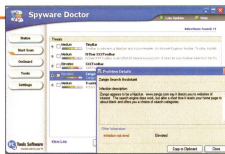
In some cases, you may find you are unable to use some sites on the Net with Spyware Doctor running. If this becomes a problem, disable Cookie Monitoring so you can surf the Web (do this from the OnGuard options screen). Periodically run a scan to check your cookies are safe and to remove all that are not. If desirable cookies turn up in the 'Threats List', select them, right-click and select 'Move to the Ignore list' so they will be ignored in future. ☺

STEP BY STEP PROTECT YOUR SYSTEM WITH SPYWARE DOCTOR



1 Once you have registered your version of Spyware Doctor, go to 'Live Update' and make sure you have the program updated with the latest malware information. Click OnGuard—> Immunizer—> Immunize Now. Run a full scan by clicking Start Scan—> Full System Scan—> Start Scan.

2 When the scan is complete, analyse the threats that have been found. Double-click a threat to read more information about it. To remove threats, select those to remove (or click 'Check All' to select all of them) and then click 'Fix Checked'.



3 Configure the program so that your computer is protected in future. Click OnGuard—> Scheduler to set the frequency of updates and scans, and make sure OnGuard is running by enabling its checkbox. The Settings tab offers other options, such as starting the program automatically whenever Windows starts up.



Phones for your PC

Want to make cheap voice calls from your PC? Roulla Yiacoumi tests the essential devices you'll need.

We've seen elsewhere in this issue how Voice over IP (VoIP) can save hundreds

on your phone bill, but if you sign up with a VoIP provider, these commit you to paying a monthly plan. An even cheaper option is to use your PC and free VoIP software (see Rose Vines's guide on page 77). All you need is a microphone for your PC, which can cost a little \$14, plus PC speakers or a cheap pair of headphones to plug into your PC. A better alternative to a microphone for many people is a

headset. With your mic and headphones in one unit, your conversation isn't beamed to those around you. The headsets in our roundup range from \$15 to \$100. However, we found the quality of headsets was variable. But you can do more than just listen. Webcams allow you to see who you're talking to, and are great if you have family and friends that live overseas. Even though you might not see them

much in person, a Webcam means smiles and waves can be exchanged digitally. Webcams start from around \$30 for a very basic model, although the most expensive model in our roundup was \$200, and some cameras cost closer to \$300. As you'd expect, the quality of Webcams varies drastically; cameras that worked by day don't necessarily translate into cameras that work by night.

TOP TIP: Sound advice

If your PC does not have a soundcard or onboard sound chip, you won't be able to use any of the headsets featured here. These all have two 3.5mm connectors; one plugs into your speaker-out port (the same one you'd use for headphones), the other into the line-in microphone port.

DESKTOP MICROPHONES

Verbatim Microphone Desktop

For quality and value for money, this beige Verbatim microphone wins hands down. You won't find any fancy features such as noise cancellation or a mute button, but you will find a very good basic microphone. On our

test recording, although our stereo could be heard in the background, the voice was still strong and clear. This recording was easily the best of the desktop microphones. This microphone was the shortest,

standing at 21.5cm. It swivels in its base, so you can move it to best capture sound from the direction you are facing, and a monitor mount is also included. At \$13.95, this microphone is unbeatable value.

Price: \$13.95
Contact:
Verbatim
Phone: (03) 9823 0999
Web: www.verbatim.com.au - Cheap
+ Quality recording
- No extra features

Plantronics .Audio 15 PC

Given Plantronics' heritage in headsets and audio communication devices, we expected more from this microphone. Noise cancellation and a unidirectional pick-up pattern are selling points of this microphone, but neither were particularly effective. Our voice recording sounded hollow, as if

it was made in a tunnel. Background noise was still audible and our voice sounded subdued. When it comes to adjusting the microphone, it will only go up to the position pictured, although it can swivel left to right. On the inside top of the boom, right under the microphone, is a sliding mute

Price: \$24.95
Contact:
Plantronics Phone: (03) 8371 0050
Web: www.plantronics.com.au
+ Mute switch - Limited adjustment

switch, which worked fine in our tests. A monitor mount is included. The Audio 15 was marginally better than the Logitech, but still almost twice the price of the Verbatim.

Logitech USB Desktop Microphone

The only USB microphone here, the Logitech was the most expensive by far at almost \$50. For this price, you certainly get

a beautifully styled product. The black microphone sits on a silver-coloured base and can be adjusted up and down, but not

left to right. The base features a power-on switch which glows green when it's on. This button also acts as a mute when

Price: \$49.95
Contact:
Logitech
Phone: (02) 9972
3711 Web: www.logitech.com
+ Power on/off button
+ Sleek styling
- Overpriced



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pressed, as it deactivates the microphone. Beauty aside, the quality of the recording was disappointing. The noise cancellation feature dimmed

the noise of the nearby fan and stereo, but the voice recording, while audible, was the quietest of all three. In subsequent additional tests, the quality of

the recording was unacceptable. This microphone is great if you want a sculpture on your desk, but the Verbatim costs \$36 less and does a much better job.

HEADSETS

Sennheiser PC 130

Although it's the most expensive headset in our roundup, the PC 130 cemented its position as the top-of-the-line headset. The audio recording surpassed that of any other, and put the other noise-cancelling headsets to shame. The PC 130 successfully cut out most of the ambient

noise while allowing our voice to come through flawlessly; we were surprised at how noisy some of the other headset recordings were compared to the PC 130. This is an over-the-head design and is the only headset to feature the boom on the right-hand side. The boom

Price: \$99.95 Contact: Syntec
Phone: (02) 9417 4700 Web: www.sennheiser.com + Excellent audio quality + Lightweight - Expensive



is flexible (although not immediately obvious) and swivels into the correct position. The earpads were comfortable,

even a little squishy on the ears. If money isn't your primary concern, the Sennheiser PC130 is the headset of choice.

Verbatim Super Deluxe Headset with Microphone

Along with the Sennheiser PC 130, this Verbatim Super Deluxe headset is the only one to feature a uni-directional microphone. This was reflected in the quality of the audio recording, which was crystal clear. A lack of noise cancellation was evident, as the background noise was clearly

audible, but the strength of the voice recording overpowered it. This over-the-head headset is a little bulky, and at 145g, it is the heaviest of all those we tested. The headset sat comfortably and the muffs covered the entire ear. A flexible boom with large mic is located on the left. This is the best headset \$40 can buy.

Price: \$39.95
Contact: Verbatim
Phone: (03) 9823 9999 Web: www.verbatim.com.au + Affordable + Very good audio quality - Bulky



Sennheiser PC 110

At just 15g, this headset felt more like a mobile phone accessory than a PC audio headset. It was the lightest headset in our review as well as the smallest, making it ideal if you're constantly on the go. The earpiece slots discretely over

your ear (can be worn left or right by swapping the removable over-ear component). As with most over-the-ear devices, it can be a little tricky to position correctly, but once on, it is comfortable. A short rigid boom protrudes



from the outside of the earpiece. The audio quality of our recording was good, i.e. slightly muffled, and the lack of noise cancellation meant a

busy-sounding recording. Sennheiser offers a two-year warranty on this headset, which is twice as long as the other manufacturers.

Price: \$49.95 Contact: Syntec
Phone: (02) 9417 4700 Web: www.sennheiser.com + Very light - Tricky to position on ear

Verbatim Mono Headset with Microphone

So it's only a mono headset — don't let looks deceive you. This sub-\$15 Verbatim headset worked a treat. We went out of our way to create noise to truly test our headsets, but in a quiet environment, these headphones would really shine. In our test, the omni-directional microphone sucked in the sounds from all

around, and no noise cancellation meant that it all came through unfiltered. But as with its bigger brother, the quality of the actual voice was very good. In terms of design, a small earpad sits over your left ear, with a band that goes over your head with a flat panel that sits just above your right ear. A

rigid boom emanates from the left side. The earmuff, while soft, was not comfortable because of its miniature size. A larger earpiece would have been nice. This was the only headset to not have mute or in-line volume control functions. You can't really complain about the price though, nor the audio quality.



Price: \$14.95
Contact: Verbatim
Phone: (03) 9823 9999 Web: www.verbatim.com.au + Dirt cheap + Good audio quality - Mono



Sony DR-220DP

The most comfortable of the headsets to wear, this over-the-head Sony DR-220DP with a flexible boom featured large, flat earpads that rest gently on the ears, making it a great headset for extended use. There was a slight hissing sound audible on the recording, and at times, it sounded like the voice was going in and out. Nor was the mute button brilliant. Unlike the other mute controls which feature a

sliding mute on/off button, the one on the Sony headset needed to be held down to mute. When you want to 'unmute', you release the button. This is a very poor design, and somewhat ineffective. While testing the mute, we found that noise could be heard on playback. It wasn't audible, but it was noise nonetheless; noise that whoever you are speaking to

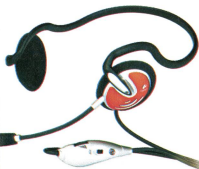
needs to tolerate. While the headset did not feature noise cancelling per se, Sony claims the microphone is "designed to minimise surrounding sound". Our test proved this to be true, with very little background sound coming through the bi-directional microphone. As comfortable as they are, \$59.95 is a little steep.



Price: \$59.95 Contact: Sony Phone: 1300 137 669 Web: www.sony.com.au + Comfortable to wear - Poor mute button



Logitech Internet Chat Headset



We're not sure when headsets became fashion items, but Logitech has decided swappable coloured earpiece casings (black, orange, purple and blue) are a must-have with its Internet Chat Headset. Don't



Price: \$39.95 Contact: Logitech Phone: (02) 9972 3711 Web: www.logitech.com + Funky design - Very average recording quality

let this gimmick detract you from the functional purpose of this behind-the-head headset. The noise cancellation feature did cancel out most of the ambient noise, but there was a noticeable crinkly sound on the recording. We tried recording our passage another three times, adjusting the microphone each time, but the noise was still audible. If cable length is critical to the positioning of your headset,

note that while the packaging claimed a 10-foot (3.05m) cable, it was in fact only 2.55m. When asked about the missing half-metre, Logitech Australia claimed they "have no say in the packaging", but acknowledged there was a discrepancy and that the US office was working on correcting the packaging. If you must have a purple headset, knock yourself out, but don't expect great things.

WEBCAMS

Logitech QuickCam Pro 4000

The most expensive Webcam in our roundup, the QuickCam Pro 4000 proved very capable. Its CCD image sensor produced brilliant daylight results; the video was very smooth and colours were bright. By night, the images were clear and the camera handled movement without a noticeable delay. Objects that were 5.5m away were clearly visible in the

background. We were also impressed with the automatic face-tracking feature, which can easily be turned on and off. When we moved, the Webcam followed precisely, and when a second person came into view, it zoomed out to allow both faces in the shot. On the down side, the installation process was lengthy, and given that the camera comes with two CDs



Price: \$199.95 Contact: Logitech Phone: (02) 9972 3711 Web: www.logitech.com + Excellent video + Face tracking - Expensive

containing various programs, the manual's instruction to 'install software first' could probably be better phrased. In all, it's a very good camera that



performed well by day and night, but is priced a bit high.

Swann Max-I-Vision

If you're after a good-quality camera at a good value price, you'll like this Max-I-Vision Webcam from Swann. This Webcam with rubber-feel finish

features a CMOS image sensor capable of a video resolution of 640 by 480 pixels. We got equally great results in both our daylight and night tests. Installation was

very straightforward. When we first observed the camera, we were a little thrown off by the yellow-red tinge on the image until we realised the camera was

self-adjusting. After a few seconds, we were presented with a clear and vibrant picture. The detail was excellent, with the background as visible as



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the foreground, although the Max-I-Vision couldn't match the image quality of the Logitech QuickCam Pro 4000. Movements in front of the camera appeared a bit blurry with a lingering 'tail', but given it is half the price of its competitor, we can forgive this.

The snapshot button captures still images at 1,280 by 960 pixels. The camera, which has an integrated microphone, can be placed freestanding on your desk, on top of your monitor, or clipped onto a notebook screen. A great buy for under \$100.



Price: \$99.95 Contact:
Swann Phone: (02)
4388 3558 Web:
www.swann.com.au
+ Excellent image detail
+ Good colour processing
+ Blurs on fast movement



Creative WebCam NX Ultra

The WebCam NX Ultra pack contains a camera and headset. Unlike the Yak-Pak, the microphone is part of the headset instead of the camera. The headset is small and wraps around one ear, with a boom mic and colour-coded speaker and mic plugs. It was very effective and gave great results. The camera, on the other hand, was capable of just 15 frames per second (fps). Creative produces a 30fps camera, the WebCam Live!, so there's no excuse for including only a 15fps camera in this set, which



Price: \$149.95 Contact:
Creative Labs Phone:
(02) 9021 9800 Web:
www.au.creative.com + Quality
components + Excellent
instructions - Too bright

is typically found on very entry-level Webcams. The result was a noticeable delay in movement, seeming as if the camera was a few seconds behind movements taking place. The NX Ultra does incorporate a CCD image sensor though, which produced images of great clarity and detail. The

main problem we found, in both daylight and night tests, was that the image was too bright. It looked as if someone was shining a spotlight in our faces, giving the image a washed-out and overexposed appearance. However, it was the only camera to provide instructions for using the supplied software within the camera manual, presenting a unified package, rather than one with software bits tacked on. A better-quality camera is required to make this package worth the asking price.



Dick Smith Internet Camera XH5121

While all the other cameras in this roundup feature a resolution of 640 by 480, this budget camera from Dick Smith makes do with just 352 by 288. Not surprisingly, it had a tough time keeping up. Good

setup instructions saw us up and running in just a few minutes. Our day images, while slightly grainy, were acceptable and the camera did a good job of processing skin tones. By night, however, it struggled. Images were dark, blurry and pixelated to the point that we found it difficult to distinguish facial features. Some ArcSoft image editing software is included, which is a bonus for a camera in this price range. If

you want to move up a notch, a Dick Smith Webcam with better specs, including 640 by 480 resolution and a built-in microphone, is available for \$79.98 (not reviewed here). All up, it's not a terrible camera, but it's best suited to communicating by day.



Price: \$39.98 Contact:
Dick Smith Electronics
Phone: 1300 366 644
Web: www.dse.com.au + Cheap
+ Good colour - Low resolution



Robot-CAM

If you've never installed a Webcam before, this probably isn't the one you want to start with. Inadequate instructions (all 17 lines of them) led to frustration as we attempted to install it. File paths did not exist, and there were file-read errors.

Once we eventually had it up and running, the camera gave the kind of average results you'd expect from a \$25 Webcam with a CMOS image sensor at a resolution of 640 by 480. By daylight, the video image was fair, but by night the images were dark and took on a jagged appearance. The camera had difficulty processing movement, and there was a noticeable



Price: \$25 Contact: Altech Computers Phone: (02) 9735 5655
Web: www.altech.com.au
+ Cheap - Problems with installation
- Poor results by night

delay between when the action took place and when it appeared onscreen. A cheap camera that works best in bright daylight. ☹

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- Sleek aluminium case
- This product relies on your computer's functioning USB 2.0 system to achieve USB 2.0 speeds
- Supports: Windows & Mac

RRP \$49.95

Mini Flip Hub 4-Port Hub



- 40 times faster than USB 1
- Super compact, lightweight design! Great for mobile users
- Supports both high-speed (480Mbps), full-speed (12Mbps), and low-speed (1.5Mbps) transfer rates
- This product relies on your computer's functioning USB 2.0 system to achieve USB 2.0 speeds
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RRP \$49.95

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- Easy to share video & still images
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- Built-in microphone provides audio in conference mode
- Works with USB 1 & USB 2.0
- Supports: Windows

RRP \$99.95

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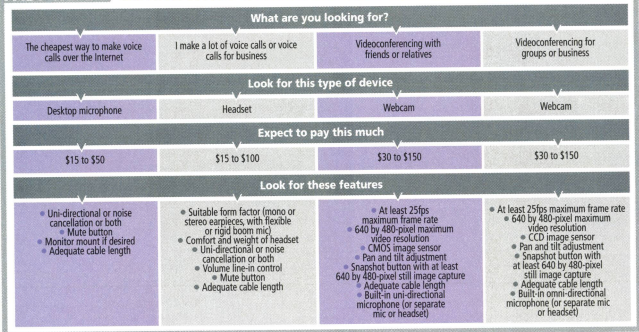
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FAST TRACK BUYING A NET COMMUNICATION DEVICE



AV Labs Yak-Pak

One of two Webcam plus headset packs submitted, the AV Labs Yak-Pak failed to impress. Consisting of a Webcam with built-in microphone and a plain set of behind-the-head earphones, there was nothing special about either component. The camera is mounted on a velvet-covered metal band that wraps around the top of the screen. This precarious perching was unstable and our camera kept slipping and moving throughout testing. If you're using this camera on a large monitor, simply pull off the mounting and sit the camera directly on top. However, this isn't an option on a notebook,

so you'll have to accept that part of your screen will be obscured. As the microphone is in the camera and not part of the headset, we found it was too far away to capture voice effectively. Our recording proved faint, an issue which became even more apparent when we moved around during the conversation. By daylight, this camera was easily the worst of the bunch. While bright, the image was extremely grainy. By night, images were quite dark and the same pixelation was evident, although the camera processed movement very well. If quality is important, invest in better separate components.



HOW WE TESTED

Desktop microphones

To test the microphones, we placed them next to a computer and spoke into them at normal sitting height; we did not lean into them to get closer. Using each microphone, a short set passage was recorded using Sound Recorder in Windows and saved as a separate file. Each recording resulted in a WAV file about 25 seconds in length. Because we don't typically use microphones in a vacuum, we created a little ambient noise with a fan placed approximately 2m away, and a stereo playing music approximately 6m away. All recordings were made within minutes of each other, at which time the ambient noise remained constant. The sound recordings were then compared, as were the features and ease of use of each microphone.

Headsets

There were two components to test with each headset: the microphone and the earpieces. The headset was worn as

instructed by the manufacturer, unless stated otherwise. We tested the earpieces by conducting conversations over Yahoo messenger and comparing the audio quality. The microphone was tested as detailed for the desktop microphones. We also evaluated the features and comfort of each headset.

Webcams

All Webcams were installed as per the manufacturer's instructions, including the installation of supplied drivers, unless stated otherwise. We used an old PC over a 512K/128Kbps ADSL connection. The cameras were tested in both daylight and evening (artificial lighting) over MSN Messenger 6.2. We observed the quality of the video and compared them to each other. Where the Webcam had a microphone, this was tested using the procedure detailed for the desktop microphones. As well as visual quality, each Webcam was evaluated for ease of setup, functions, supplied software and instructions.



Price: \$59.95 Contact: Anyware Computer Accessories
Phone: (02) 9879 5788 Web: www.avlabs.net + Affordable pack - Poor monitor mounting - Poor results by night



Net communication buyer's guide



There are a number of available options when it comes to Internet communication devices. If your computer has speakers, or if you have a plain set of headphones, the cheapest way to speak to others online is by simply using a microphone.

The main problem with a microphone is that if the person you are speaking to is using speakers, you will hear your own voice feeding back to you. This can become annoying and makes having a conversation confusing as you continually wait for the sound of your own voice to clear before speaking again. Wearing normal headphones will alleviate this problem.

A headset is a step up from a microphone. A headset incorporates a microphone for speaking and headphones for listening to a conversation, both in the same device. It's ideal for those who make a lot of voice calls, especially for business, but obviously, they're not suitable for videoconferencing or voice conferencing with a group of people at one end.

If you want to communicate using only a camera, there are lots of Webcams to choose from. At the very least, a Webcam should be able to stream images in a way that resembles video rather than still shots that are seconds apart. Some cameras have features such as a built-in microphone and a button for taking snapshots.

The ultimate in communicating online is being able to see and hear the person you are speaking to. The combination of a headset and Webcam works best in this situation. Bear in mind that they don't need to be made by

the same manufacturer to be compatible, and those Webcams that now support USB 2.0 also work well with a standard USB 1.1 port.

Some vendors have begun shipping box sets containing a headset plus a camera. This means you are tied into using their complete solution, rather than picking the best of the components you'd prefer. For example, if voice is more important to you and the image is just a bonus, you may want to spend big on the headset but settle for a basic camera.

What the specs mean

Cable length. This actually varies significantly, so check it out. Is there anything more frustrating than a cable that's not quite long enough?

Headset form factor. Headsets come in various designs. They can be worn over the head, behind the head, or over one ear, like a mobile phone Bluetooth headset. A mono headset is great if you need to free up one of your ears so you can hear what's going on around you. The advantage of a good stereo headset is that it can double-up as an effective gaming or music accessory. Most headsets feature a boom microphone, which can be either flexible or rigid. The advantage of a flexible boom is that you can adjust the microphone in the exact position you choose, but this also gives greater room for error. A rigid boom will move into position the precise distance it is supposed to be from your mouth. Also consider the comfort and weight of the earpieces.

Image sensor. The key component in a Webcam, which

captures the image. There are two types: a CCD (charge-coupled device) like a digital photo camera, or cheaper CMOS (complementary metal oxide semiconductor). A CCD captures greater detail, but is found only in more expensive Webcams.

In-line volume control. This allows you to easily adjust the volume of the incoming audio. **Monitor mount or freestanding.** Not all microphones and Webcams can be attached to a monitor. Conversely, we found one Webcam that was designed only for monitor mounting, and couldn't sit on the desk. Either way, make sure you get a design that suits you or preferably one that can do both.

Noise cancellation. A feature integrated in microphones and headsets, which is designed to cancel out ambient noise such as traffic and air conditioners. However, this feature is more effective in some mics than others.

Pan/tilt adjustment. All good Webcams should have the ability to adjust the direction up and down (tilt) and left and right (pan).

Snapshot button. All Webcams can capture still images using software, but this button will allow you to do it easily.

Still image resolution. This indicates the maximum size of still images that the Webcam can capture. Note that some Webcams advertise a higher still resolution than video resolution, but they usually do this with software trickery. It may be a handy feature, but not as good as native resolution, and nowhere near as good as a digital photo camera.

Uni-directional or omni-directional.

Desktop microphones and the mics in headsets have different ways of picking up sound. An omni-directional microphone is equally sensitive to audio coming from all directions, making it ideal for videoconferencing or voice conferencing with a group. For single users, a uni-directional mic is generally more suitable, because it's most sensitive to sounds originating from one direction only. However, not all uni-directional mics are effective in reducing ambient noise.

Video frame rate. Like all video, Webcam video is captured in frames, and the faster the rate of capture (the frame rate), the smoother the video will be. A frame rate of 25 frames per second (fps) or higher is ideal, while 15fps is quite jerky.

Video resolution. In addition to the frame rate, you also need to consider the size (or resolution) of the frames captured. A comparatively large 640 by 480-pixel frame will allow your captured images to be sharper and/or bigger onscreen than a 352 by 288-pixel image. Unfortunately, most Webcams force you to compromise either the frame rate or the resolution. Our preference is for smooth video, so we'd compromise the resolution. But either way, look for a camera that allows you to lower the resolution to increase the frame rate, or vice-versa.

Cool and new

The PC User team tests the latest tech gadgets.

Sorell SV-10

The Sorell SV-10 is a neat portable audio/video player that has a 20GB hard drive, built-in FM radio and 1.3-megapixel (MP) camera for recording video and taking photos. The player has both AV in and out, so you can record from any source or play back

your media files on a TV or stereo. The SV-10 can play back most video formats and even includes PC-based conversion software for anything it can't play. The screen has excellent contrast and offers simply outstanding picture quality, compared to many other portable media players and PDAs. Battery life on the SV-10 was simply astounding. While playing a movie with the volume at an audible level, the unit lasted an astounding seven hours. Playback of standard XviD movies was a little jumpy, but still watchable; DivX, on the



other hand, was very smooth. The audio output would be decent enough for a few people to enjoy and the quality was also very good. The joystick provided for navigation is a little small and takes some getting used to, but it's reasonably effective overall. The player is quite comfortable to hold and, weighing in at only 230g, it's no trouble to carry around over long periods of time either. The

9 Price: \$799 Contact: mStation Phone: 1300 131 035 Web: www.mstation.com.au

Sorell SV-10 has to be one of the better personal media players out there; it has a great screen and an extensive list of features while not being overly expensive. Highly recommended. — Nick Mallath

NEC VT47G

Data projectors have been rapidly dropping in price recently and, at just \$1,399, NEC's VT47G is the cheapest full-function, full aspect ratio unit we've seen so far. Its native resolution of 800 by 600 pixels makes it perfect for DVD movies, while its internal processing can handle video input resolutions of up to 1,280 by 1,024 pixels. The screen

brightness is 1,500 ANSI lumens with the projector lamp flat-stick, easing back to 1,100 ANSI lumens in economy mode, which extends lamp life from 2,000 to a healthy 3,000 hours. It's also quiet, with a noise level of just 28dB. The VT47G also features automatic vertical keystone correction, so if the vertical angle of projection is off-centre the projector will automatically clean it up to produce a perpendicular image again.

The contrast ratio is 400:1, which is not as good as DLP (digital light processing) projectors, but typical of low-cost LCD models. While this is the sharpest projector we've seen, the drawback is its fixed zoom lens, forcing you to rely on lesser-quality digital zoom to vary the image size. All up though, at this price, it leaves a plasma TV for dead. — Darren Yates

8 Price: \$1,399 (\$433 replacement lamp) Contact: NEC Phone: 13 16 32 Web: www.nec.com.au



iRiver H340

Apple continues to inspire a rash of hard drive MP3 players, with a growing number of Taiwanese-brand imports now landing in Australia. Despite the fact that it has a small colour TFT capable of displaying JPEG images, iRiver's H340 unfortunately doesn't match the iPod in the looks department — it's more like an old transistor radio. It also isn't as user-friendly as it should be, especially in its button size and placement. It's not that intuitive either, with a nondescript key combination

required to get the unit into data transfer mode, for example. On the upside, the H340 features an FM receiver, as well as the ability to directly encode external sources to MP3, and it doesn't require driver software to plug into your PC. It supports MP3, WMA and Ogg Vorbis audio files, although it sadly lacks the ability to play back PCM/WAV files, which would have been nice given the 40GB Toshiba MK4004 hard drive inside. The audio quality wasn't brilliant in our tests, with a signal-to-noise ratio of only 72.5dB (A-weighted) and total harmonic distortion of 0.023% (A-weighted), both at

1kHz. So, while the H340 isn't specifically bad, the added fact that you can't remove the Lithium Ion battery means this MP3 player doesn't rank as highly as some of the other models we've seen of late. The \$669 price tag means it's \$20 more than the same capacity iPod, but the extra features make it worth considering if you want a more full-featured MP3 player. — Darren Yates

7 Price: \$669 Contact: mStation Phone: 1300 131 035 Web: www.iriver.com



XDA II mini



The XDA II mini is a return to basics for creator O2. While the XDA II and IIs became monster-sized PDA plus phone devices, the mini has been slimmed down, without losing any significant functionality. The tri-band mini packs in an Intel 272 614MHz processor running Windows Mobile 2003 Pocket PC. It incorporates a sparkling 2.8in 65K colour

Price: \$1,199 Contact: O2
Phone: (02) 9699 2220
Web: www.seo2.com

touchscreen, and GPRS and Bluetooth functionality are built in. O2 has done away with the proprietary connector used by the original XDA, opting for a standard mini USB interface instead. The mini does not come with a cradle. Tilting the phone on its side gives easiest access to the CMOS 1.3MP colour camera and video recorder function. While the camera was easy to use, the photos looked washed-out, and greens and reds appeared most dull. While the device can play MP3 and MPEG-4 files, it's far from being a dedicated

entertainment product. It comes with Pocket Word, Excel, Outlook, PowerPoint and MSN Messenger for staying in touch on the go. There's also an integrated speakerphone for convenient hands-free operation. The mini is also bundled with a 256MB SD card. It's great for the busy professional who doesn't want to lug around a separate mobile phone and organiser.

— Roulla Yiacoumi

Cosonic CD-788V

These noise-cancelling headphones are a great idea; typically, they're used in aviation to cut down ambient noise, so pilots can clearly hear the local airport control tower. However, the idea also works well for passengers and that's what these CD-788V headphones are designed for. Although these headphones won't cancel out noise completely, they do a remarkably good job of cutting down the ambient noise level in locations where it's enough to

send you barmy. Twin electret microphones in the earphone shell pick up ambient sound, feed it to the small amplifier, invert the signal phase and feed it back into the earphone transducers. The end result is you hear the music, but much less of the ambient noise. The CD-788V isn't the most comfortable set of headphones (too much pressure on your ears and no headband cushion), but at a fraction of the cost of professional-grade noise-



cancelling headphones, they're still well worth a try.

— Darren Yates

Price: \$44 Contact: Altech Computers
Phone: (02) 9735 5655
Web: www.altech.com.au

iRiver PMP-120

Like the Sorell SV-10 opposite, the iRiver PMP-120 is another portable audio/video player that has a PDA-type screen. While the contrast isn't spectacular on this unit, the picture quality is still good on the whole. XviD playback was initially a little jumpy in our tests (we're yet to see one of these devices successfully play back high-resolution XviD video), but after re-encoding our AVI file with the supplied software, it was very smooth. The PMP-120 uses USB 2.0 to transfer files, but is also equipped with a USB 1.1 host port. You can connect your digital camera to the host port and transfer your pictures to the player's 20GB hard drive for

Price: \$689
Contact: MStudio
Phone: 1300 131 035
Web: www.iriver.com



extra storage, or to view them on the larger screen. The player weighs only 288g and is designed to sit comfortably in your hands. The buttons are well positioned for easy navigation of the menus. Sound is delivered either through the built-in speaker or headphone jack, both of which have respectable output. You can record from the internal FM radio, line-in jack or even the

built-in microphone to MP3 at 128Kbps. Battery life was significantly lower than the Sorell, but still quite decent at three-and-a-half hours. With features like a USB host port and good video playback, along with a price significantly less than the competition, the PMP-120 is an attractive option if you're in the market for a portable media player.

— Nick Mailath

HARDWARE Apple AirPort Express

This compact device lets you wirelessly stream your digital music from your PC to your stereo; it's essentially a 54Mbps wireless access point with an onboard audio processor. The advertised iTunes streaming feature requires the iTunes player to work. Basically, you queue up the files you want to play on your PC, and the AirPort Express outputs the audio to a 3.5mm jack. In testing, we found the streaming audio only cut out when the signal reached 1 or 2Mbps. The included power plug attaches to the unit and allows it to hang from the power point. While plugged in, it is held stable by the power socket. We had some initial problems with the software used to set up the device, but we managed to get it working through Windows standard wireless networking. Overall though, it's simple to use with good wireless performance.

— Nick Mailath

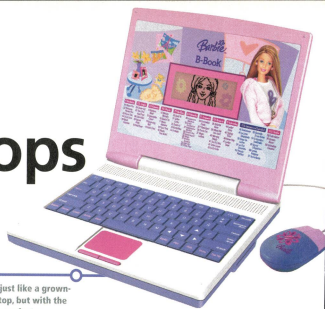
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It looks just like a grown-up's laptop, but with the Barbie wow factor.

Barbie B-Book

The Barbie B-Book Learning Laptop looks just like a grown-up notebook. It's just about as Barbie as it gets: the pink and mauve colour scheme, illustrations of Barbie all over the place, and Barbie narrating all the games; there's even a Barbie mouse mat and ball mouse included, both with distinctive Barbie branding. However, once you open the B-Book and fire it up,

you're likely to be disappointed by the graphics, as the screen is tiny and the graphics are only in black-and-white, and very blocky. That said, there is a good range of activities on offer, with 50 different educational games to play, divided into 10 categories. There are also three expansion cards available for an additional cost to add more games to the laptop. The games start on the middle difficulty

level and points are awarded for successfully completing activities. If you score well, you move onto the highest level, but if you underperform, you drop to the easiest level and you can work your way up from there. At the end of your playing session, your level is saved for next time. A Demo key lets you see what you need to do in each game, and the games can be paused at any time during play. Most games have a one-minute time limit for answering, and you get three attempts to answer the questions correctly. There's also

an Answer key you can press to get the correct answer to a question, and the sound and brightness levels of the screen can be adjusted using the Shift and function keys. The B-Book runs on four AA batteries, and turns itself off after a period of inactivity to extend battery life — a great feature that will appeal to parents. You can use a 9V adaptor for electricity, but you'll have to buy your own, as there isn't one included. The notebook can be a little tricky to open, but it's probably easier with little fingers.

Hot Wheels Accelerator

And now one just for the boys! This has to be the hottest-looking kids' learning hardware not on four wheels. It is shaped like the bonnet of a Hot Wheels car and features a black satin finish and the trademark Hot Wheels flames with a number plate as the opening clasp. A Hot Wheels mouse and mousepad are also included, but the mouse is a ball-type one, so you'll have to watch for grime build-up from grubby little mitts. Unfortunately, the impressive external appearance of the laptop doesn't quite carry through to the inside. When you open up the laptop, the inside looks very colourful, but you are likely to be disappointed with the tiny black-and-white screen and the very basic graphics. As well as the usual keys on the

keyboard, there are keys that allow you to watch a demo of each activity, choose to play with one or two players, pause an activity, request an answer, have a question repeated, turn the music on and off, and get help if you are not quite sure what to do next. There is a great range of activities on offer — more than 50 learning games covering vocabulary, grammar, spelling, maths, logic, memory and music — but 10 of these activities are in Spanish, so unless you are bilingual or are learning Spanish, these will be virtually useless to you. A calculator and picture dictionary are also included, along with a few screensavers to choose from. The laptop operates on four AA batteries, but you can purchase an AC

7.5 Ages: From five years
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adaptor separately. However, the laptop will turn itself off after a period of inactivity, so it isn't as battery-hungry as many other battery-operated toys. Because the Hot Wheels Accelerator is made in the US, Australian kids may have the odd problem with the US spellings in the word games. It's disappointing that the units

being sold here haven't been adapted for the Australian market when it comes to spelling, because there are some quite Australia-specific words included in the activities, such as reference to koalas. 🐨



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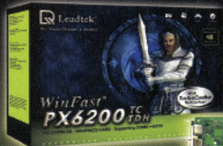
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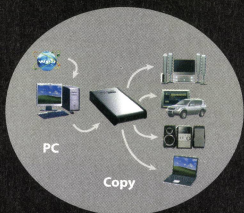
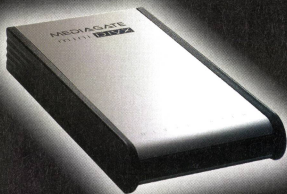


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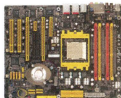
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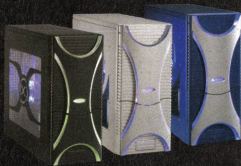
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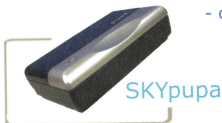
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T003	\$ 9.90	T018	\$13.20	T039	\$13.70	T0491/2/3	\$ 8.90	S020187	\$ 5.60
T005	\$18.00	T019	\$ 7.70	T0321	\$15.10	T0494/5/6	\$ 8.90	S020189	\$ 6.50
T007	\$10.80	T020	\$11.20	T0322/3/4	\$13.50	S020025	\$11.20	S020191	\$ 9.90
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Model	Genuine	Compatible	Model	Genuine	Compatible
BX-3	\$49.00	\$28.00	BCI-3PC/3PM	\$19.00	\$6.40
BC-01	\$39.00	--	BCI-6BK	\$24.00	\$6.40
BC-02	\$39.00	\$28.00	BCI-6C/M/Y	\$24.00	\$6.40
BC-03	\$38.00	\$28.00	BCI-6PC/6PM	\$24.00	\$6.40
BC-05	\$50.00	\$35.00	BCI-21BK	\$13.00	\$4.90
BC-20	\$49.00	\$28.00	BCI-21C	\$28.00	\$6.40
BCI-3eBK	\$25.00	\$ 8.80	BCI-24BK	\$14.00	\$5.60
BCI-3eC/M/Y	\$19.00	\$ 6.40	BCI-24C	\$33.00	\$7.20

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Model	Genuine	Compatible
16125A (#25)	\$46.00	\$30.00
16126A (#26)	\$46.00	\$30.00
16129A (#29)	\$46.00	\$30.00
16145A (#45)	\$46.00	\$30.00
16149A (#49)	\$48.00	\$30.00
18116A (#16)	\$63.00	--
C1823D (#23)	\$51.00	\$32.00
C6578D (#78)	\$51.00	\$32.00
C6614A (#20)	\$44.00	\$28.00
C6615DA (#15)	\$44.00	\$28.00
C6625A (#17)	\$48.00	\$30.00

Model	Genuine	Compatible
C6656AA (#56)	\$32.00	\$24.00
C6657AA (#57)	\$51.00	\$32.00
C6658AA (#58)	\$37.00	--
C8727A (#27)	\$31.00	--
C8728AA (#28)	\$35.00	--



Lexmark Ink Cartridges

Model	Genuine	Compatible	Model	Genuine
12A1970	\$48.00	\$32.00	18L0032 (#82)	\$47.00
12A1980	\$56.00	\$35.00	18L0042 (#83)	\$53.00
17G0050	\$46.00	\$32.00		
17G0060	\$53.00	\$35.00		
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10N0217	\$33.00			
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Model	Genuine	Compatible
HP 92274A	\$145.00	\$ 59.00
HP 92298A	\$149.00	\$ 65.00
HP C3906A	\$105.00	\$ 59.00
HP C3903A	\$130.00	\$ 75.00
HP C3909A	\$249.00	\$115.00
HP C4092A	\$ 99.00	\$ 59.00
HP C4096A	\$155.00	\$ 65.00
HP C4127A	\$155.00	\$ 65.00

Model	Genuine	Compatible
HP C4127X	\$195.00	\$ 80.00
HP C4129X	\$249.00	\$115.00
HP C4182X	\$285.00	\$165.00
HP C7115A	\$ 99.00	\$ 59.00
HP C8061X	\$195.00	\$ 85.00
HP Q1338A	\$219.00	\$ 85.00
HP Q2612A	\$ 99.00	\$ 65.00
HP Q2613A	\$ 99.00	\$ 65.00

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Samsung ML-4500D3	\$ 97.00	\$49.00
Samsung ML-5200D6	\$163.00	\$65.00
Samsung ML-6060D6	\$155.00	\$65.00
Samsung SCX-4216D3	\$ 99.00	--
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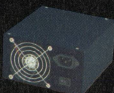
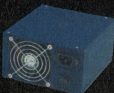
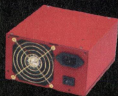


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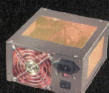
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CANON BJC-600/610/620	16	5-BKL
CANON BJC-2000/4000/4100/4200/4300/4550/5000/5500 BCI-21	45	19-BKL
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CANON BJC-3000/6000/6500	6	46-BKL
HP Desk Jet 400/500 Series	6	8A-BKL
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EPSON Stylus 820/colour little	12	23-BKL
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CANON BJC-3000/6000/6500	3x12	14A-CLR
HP Colour Desk Jet 300/400/500 Series & Olivetti!	3x12	14B-CLR
HP Colour Desk Jet 600C/660C/690C Series	3x3	30A-CLR
HP Desk Jet 850C/855C/870C/1000C Series	3x3	30B-CLR
HP Desk Jet 710/720/980 Series	3x4	16-CLR
EPSON Stylus Colour PRO/XL	3x12	24-CLR
EPSON Stylus 820/colour little	3x12	34A-CLR
EPSON Stylus Colour 200/300/400/500/600/800/850/1520	3x12	34B-CLR
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